

SPECIAL ISSUE: ANNUAL UTILITY GUIDE

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Secret MP3 Plans

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- Casio Cassiopeia E-15 and Philips Nino 200



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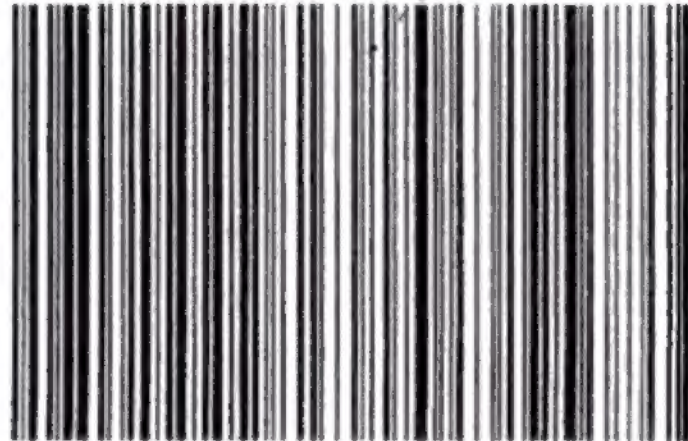
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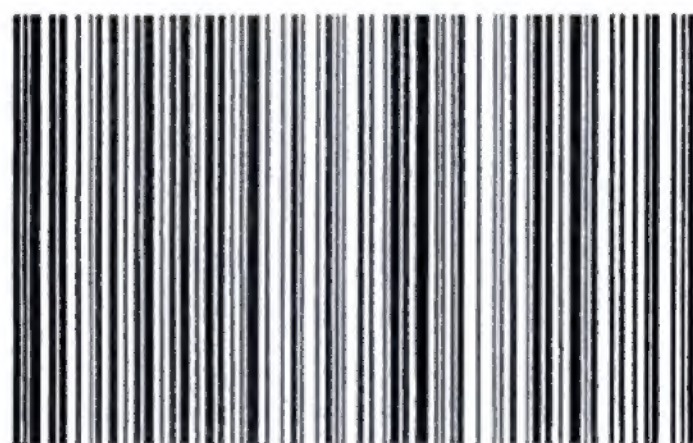
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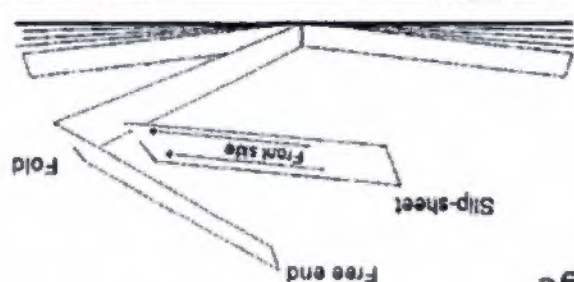
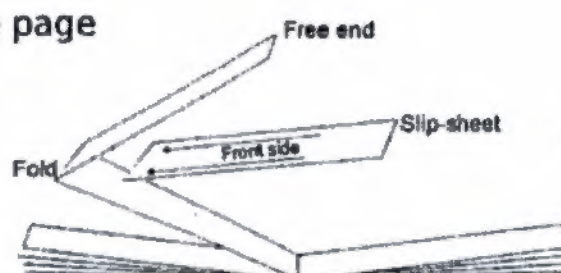
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PC Magazine June '98

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Monitor	17" Micron 700Vx monitor (15.9" display)	17" Micron 700Vx monitor (15.9" display)	17" Micron 700Vx monitor (15.9" display)	17" Micron 700Vx monitor (15.9" display)
CD-ROM	40X CD-ROM drive*	40X CD-ROM drive*	40X CD-ROM drive*	40X CD-ROM drive*
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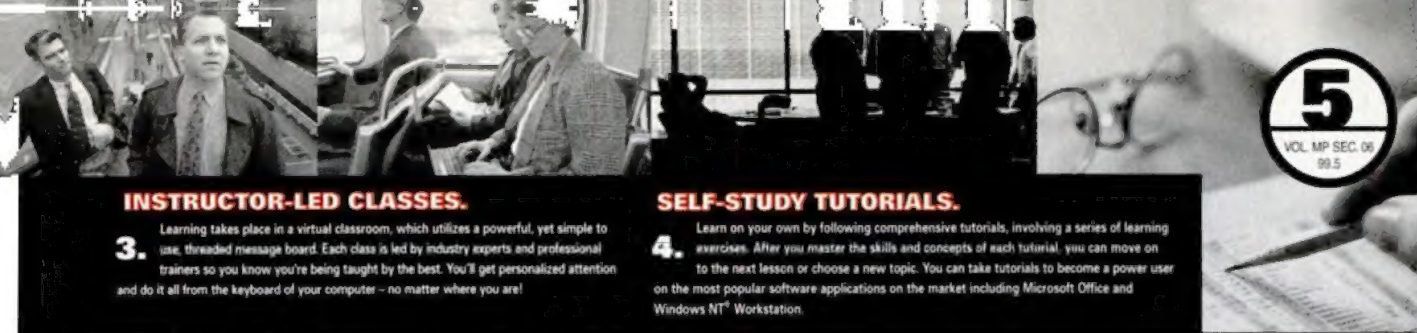
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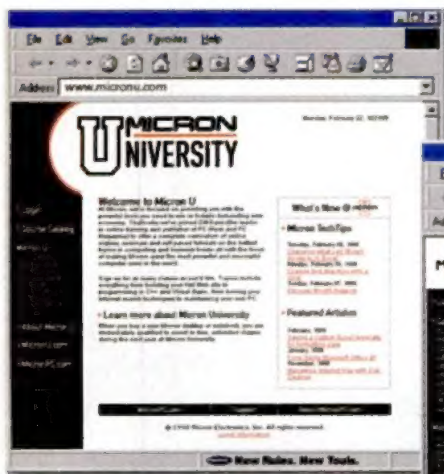
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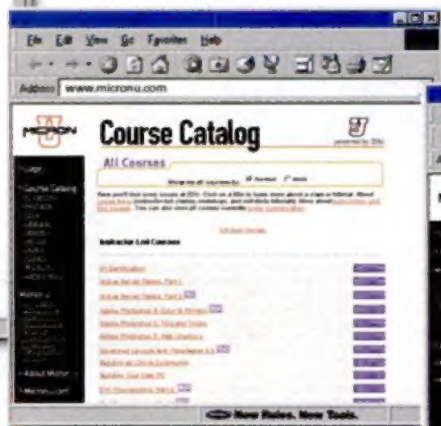
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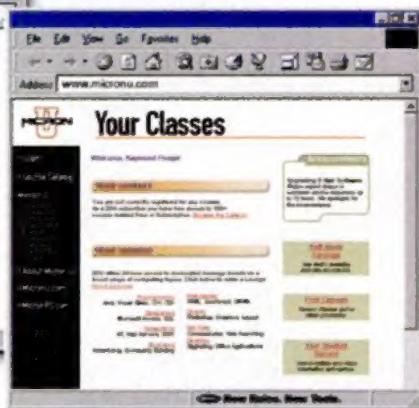
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- HTML Tables & Frames
- Create Web Graphics with Paint Shop Pro

Internet

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- Five JavaScript Rollovers in Five Days
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- Promote Your Web Site in Five Days
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- Intro to FrontPage 98 (2 parts)
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- Optimizing Web Site Performance

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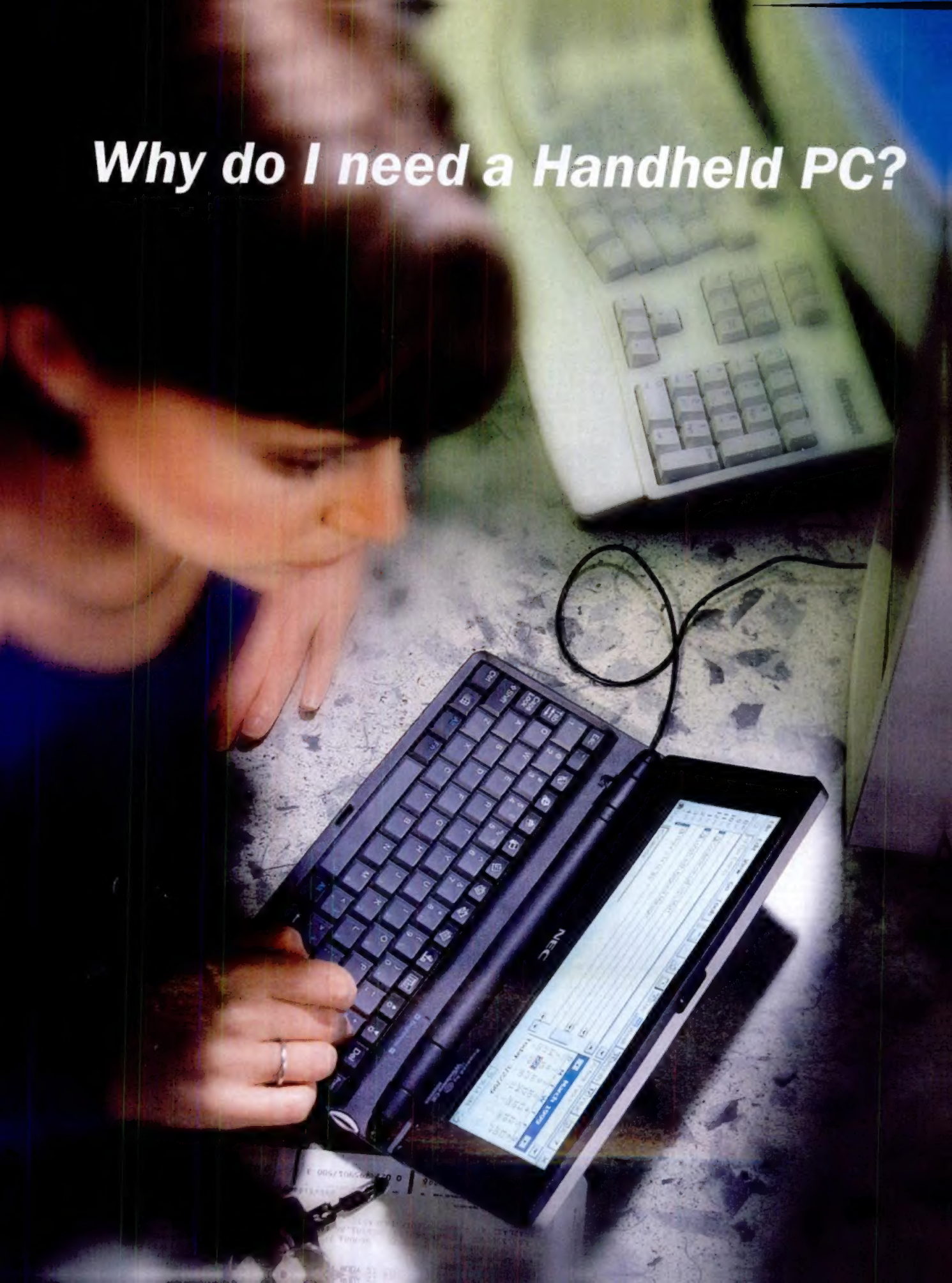
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Internet Killed the Video Star

"Video Killed the Radio Star" is the title of the first video played on MTV when the music video network debuted in August 1981. And though radio is still around, there's no question that music videos have changed the nature of the music business, for better and for worse. And in a similar way, the Internet is

changing the nature of both music and video. The first audio broadcast on the Web coincided with the introduction of RealAudio 1.0, as Progressive Networks (now RealNetworks) broadcast the audio feeds of both National Public Radio and ABC Radio on April 10, 1995.

The first changes were pretty simple; it became easier to listen to samples of songs, order CDs or tickets online, and find out all sorts of things about your favorite artists, films, or TV shows. But the changes happening now are much more fundamental. They deal with everything from the way we listen to music and watch video to the kinds of stations or channels we tune in to.

Format changes are happening very quickly, as downloadable digital formats—particularly MP3—explode in popularity. Today you can download tens of thousands of songs to your PC or to a portable player. Some of this is legal; a lot is not. But it's made record companies take notice, and they in turn are spurring competition for digital formats that give them some control over copying and distribution. I'm skeptical that any of these alternatives or additions to MP3 will take off anytime soon, but over time, my guess is the record companies will find something they can live with that customers will buy.

But whatever happens, the Internet will change the way music is distributed. Already the Internet offers a distribution channel for thousands of artists whose work you won't find at your local record store.

Where you tune in is about to change as well. RealAudio pioneered live broadcasts on the Web, and now a fairly large number of radio stations broadcast simultaneously on the Internet. (Broadcast.com has a great list, and Real and Microsoft have their own lists as well.) I like to tune in to my favorite radio station from San Francisco (KFOG), and one of my coworkers is a fan of an Austin station (KGSF). All this has gotten easier with things like the new

radio toolbar in Microsoft Internet Explorer 5, which lets you select your favorite stations and play them by clicking a button. Not to be outdone, Real just introduced its own Explorer Bar, which does similar things. I keep both RealPlayer Plus G2 and Windows Media Player on my system, though I tend to prefer RealPlayer, because it sounds better.

The result is that instead of being limited to local radio, it's easy enough to find whatever station you'd like. And that may lead to both more diversity and perhaps more national or international stations.

Your video choices are more limited but growing quickly. Already I can find a lot of music videos at sites such as Musicvideos.com, streaming shows from sites

such as Fox News and ZDTV, and highlight clips from news channels and my local cable company. Thus far you can't quite get all your favorite entertainment shows this way, but with the growth of both broadband technology and users, you can bet it's coming.

That will raise other issues. Five hundred channels and nothing on? Forget it. The future has thousands of channels. And if you think MP3 has changed music, note that by next year we'll have PCs capable of creating

MPEG video on the fly as well. When that happens, I'm sure that—legally or not—some people will create sites with TV shows or movies as well.

All this is certain to have a major effect on how TV shows and movies are made and distributed. In the same ways the music industry is being impacted today, the networks and cable companies and TV and movie studios will be affected in a few years.

In addition, this will make all of us have to worry more about the bandwidth allocations on our business networks. Like it or not, these changes are coming.

Perhaps the appropriate music for the next few years might be something like "Internet Killed the Video Star"? **PC**

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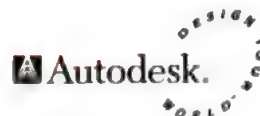
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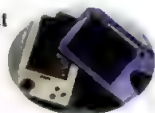
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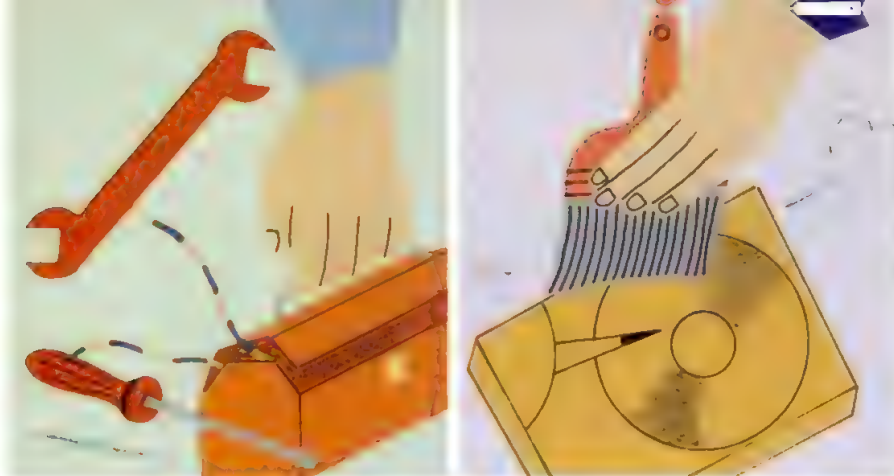
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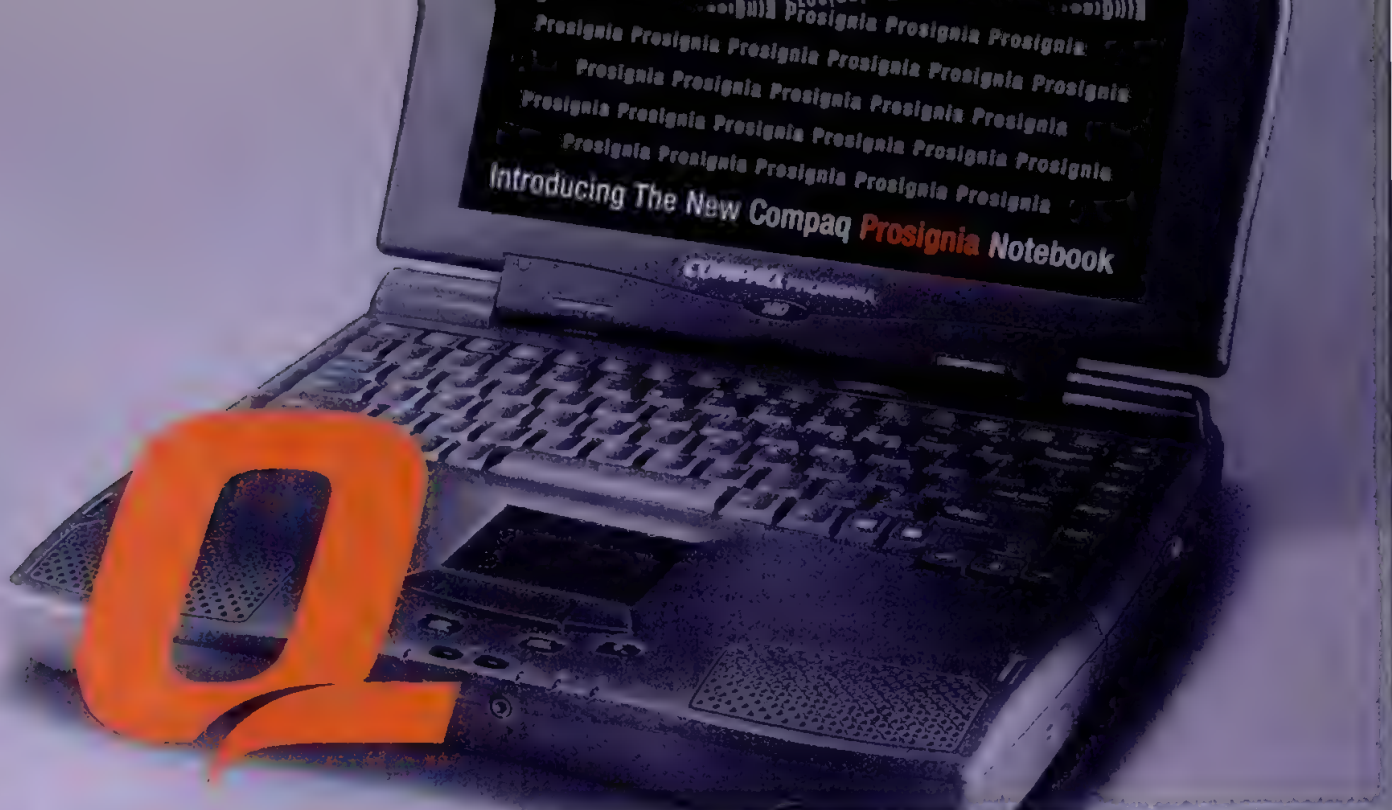
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The Party Line

Hewlett-Packard, Intel, Nortel, and Microsoft have converged on a party line. The four giants have formed a far-reaching partnership to link advanced voice- and data-networking technologies with semiconductors, PCs, and browsers. In a recent announcement at the Technology Museum

high-speed DSL modem, to the new Pentium III processor. This would create a cost-efficient method for system manufacturers to offer built-in high-speed bandwidth and network connections. The Pentium III chip is optimized for rich media, and in announcing the processor, Intel officials called for better communications band-



of Innovation in San Jose, California, HP CEO Lew Platt said that the partnership could quickly make it much easier for businesses to implement low-cost voice- and data-networking technologies.

The agreement between the four companies is expected to produce a series of converged communications and computing products over several years, the first of which will arrive this year. For example, Nortel is currently working with Intel to link the Nortel 1 Megabyte Modem, a

width on the PC platform.

Hewlett-Packard and Microsoft are both working with Nortel on integrating software services, such as networking and remote-access protocols, with Nortel devices. Unified messaging is also one of the more interesting goals of the partnership, which follows closely on the heels of Sun Microsystems' recent partnership with Lucent to facilitate unified messaging, where messages of all types—from e-mail to voice mail—can be retrieved and sent from one application.

Venture into the Net

Venture capital investment in information technology companies continued to soar in 1998, reaching an all-time high of \$7.8 billion, according to research firm VentureOne. IT remained the strongest component of a total venture capital investment of \$12.5 billion, making up

over 62 percent of the dollars invested. Most of the IT deals were in communications and information services companies, with the largest investment of 1998 (\$101 million) going to WNP Communications. The largest venture-backed IPO was Global Telesystems at \$222 million. Internet companies accounted for over 30 percent of all venture-backed companies going public in 1998, a dramatic rise from the previous year's 12 percent.

IT VC on the Rise

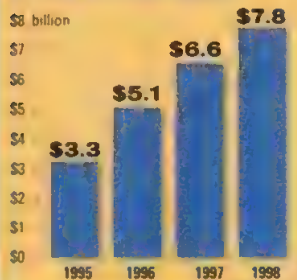


ILLUSTRATION BY JOHN UELAND

41%

of respondents to a recent PC Magazine Online poll told us they consider the Y2K threat only a minor worry. 28 percent said they feel moderate concern, but another 28 percent said they weren't concerned at all. Only 3 percent of respondents said they feel true fear.

A High-Speed Office

Driving to work may take on a new dimension in the Mercedes-Benz V-Class Multi-Purpose Vehicle from IBM and Daimler-Chrysler. An optional business console located in the back seat includes a desk, an IBM ThinkPad with ViaVoice speech recognition software, a printer, a telephone, fax capability, and a high-speed wireless connection to the Internet through the GSM network.

IBM promises reliable data transmission even in tunnels so you can keep in constant touch with clients, follow a virtual map to your destination, contact your car dealership for immediate service, or keep yourself amused by downloading games from the Internet. You can also remove the console to turn the car back into a family or leisure vehicle.

The office option for the Mercedes costs \$12,000 and is available only in Europe. Daimler-Chrysler is considering outfitting other cars for the North American market.



Car talk: Multitasking in a Mercedes Multi-Purpose Vehicle.

Where Are They Today?

January 1996: The country suffered through one its worst winters ever, only ten people knew about President Clinton and Monica, and one of your favorite Web sites was the University of Michigan's. Before Web surfers spent all their time shopping and building free home pages, a smaller and more technically oriented group had decidedly different tastes. Media Metrix, an Internet-audience measurement firm, recently rereleased its audience rankings from January 1996, and they offer a stark contrast to today's list of Web heavyweights. Only 3 of 10 sites from 1996 are still in the top 10 today.

JANUARY 1996		JANUARY 1999	
1 AOL.com	10 Webcrawler.com	1 AOL.com	10 Yahoo.com
2 Netscape.com	11 Yahoo.com	2 MSN.com	11 Geocities.com
3 Yahoo.com	12 Infoseek.com	3 Go.com	12 Netscape.com
4 Prodigy.com	13 Compuserve.com	4 Excite.com	13 Microsoft.com
5 Umich.edu	14 Primenet.com	5 Lycos.com	14 Tripod.com
6 Well.com			

Search and Retrieve (Your Coworkers)

You're about to close an important deal, and all you need is one more signature from the manager. As usual, he's not at his desk, so you race through the office's labyrinthine corridors trying to track him down in time. To speed up your search, Arial Systems has developed a browser-based tracking system that, optionally, comes with wireless (infrared or RF) name badges. Sensors located throughout the office pick up the wearer's location information and feed it into a browser-based application. Although it has Orwellian overtones, CEO Jim Alland says that the system can help customer service-oriented companies find the right people with the right information as quickly as possible. "If an organization is highly service-focused and requires a great degree of collaboration, these badges are a tremendous benefit. It's not Big Brother, it's big customer," he says.

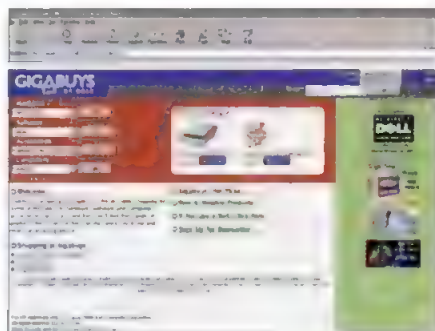


E-Shopping Esperanto

At Microsoft's recent E-Commerce Solutions day in San Francisco, the company evangelized a new e-commerce solution to ship later this year: BizTalk, a BackOffice server product based on XML (eXtensible Markup Language). Microsoft's plan is to integrate BizTalk with the entire Microsoft Commerce Platform. "There needs to be a single technical vocabulary for describing online business processes," says Microsoft CEO Bill Gates.

BizTalk will include schemas for corporate purchasing, product catalogs, offers, and promotional campaigns on Microsoft's MSN site. Elements of the

BizTalk server product will be incorporated eventually into all of Microsoft's platform products, including Windows, the next



Gigabuy's: Built on Microsoft Commerce Platform.

version of Commerce Server, and Visual Studio.

Dell's new Gigabuy's.com site, an online hardware/software superstore, is among the sites already built on Microsoft's Commerce Platform.

Mobile Money Machines

Smart cards with tiny embedded processors for holding digital cash haven't met with success in the U.S., but they're popular in Europe, where developers are now testing out another twist on the concept. Barclaycard, mobile phone company Cellnet, and Visa are conducting a trial of mobile electronic cash machines that let residents of Leeds, England, download e-cash over Cellnet's GSM network to their Barclaycards. After the card is inserted into a specially designed Motorola StarTAC mobile phone, the phone asks the user to enter an amount up to £50 and a PIN number for security. The e-cash is then deposited onto the Barclaycard and debited from the user's bank account.



Calling for cash: The U.K. is testing out a wireless digital-cash system.

Top-Selling Ink Jet Printers

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- 2 HP DeskJet 722C (\$262)
- 3 HP DeskJet 712C (\$208)
- 4 Canon BJC-250 (\$121)
- 5 Lexmark CJP 1100 (\$98)
- 6 Canon BJC-4400 (\$142)
- 7 Epson SC 640 (\$178)
- 8 Epson SC 740 (\$256)
- 9 Epson SC 440 (\$137)
- 10 Lexmark CJP 3200 (\$176)

Source: ZD Market Intelligence, retail data for January 1999

The Eight-Chip Challenge

At the recent CeBIT computer trade show in Germany, eight-way PC servers were all the rage. For months, Intel has been promising a key chip set, dubbed Profusion, designed for eight-processor servers, but the chip set has had multiple delays. At CeBIT, Compaq showed a prototype eight-chip server, and several other companies including IBM, NEC, and Siemens announced plans to ship systems this year.

Compaq and Intel officials said that the first eight-way servers should ship by the end of the second quarter.

E-Banking Boom

Reflecting consumers' surging interest in online banking and trading, respondents to a recent ZDNet InternetTrak survey indicated that they were highly likely to participate in several online financial activities in the three months following the survey.



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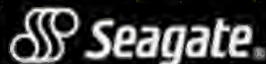
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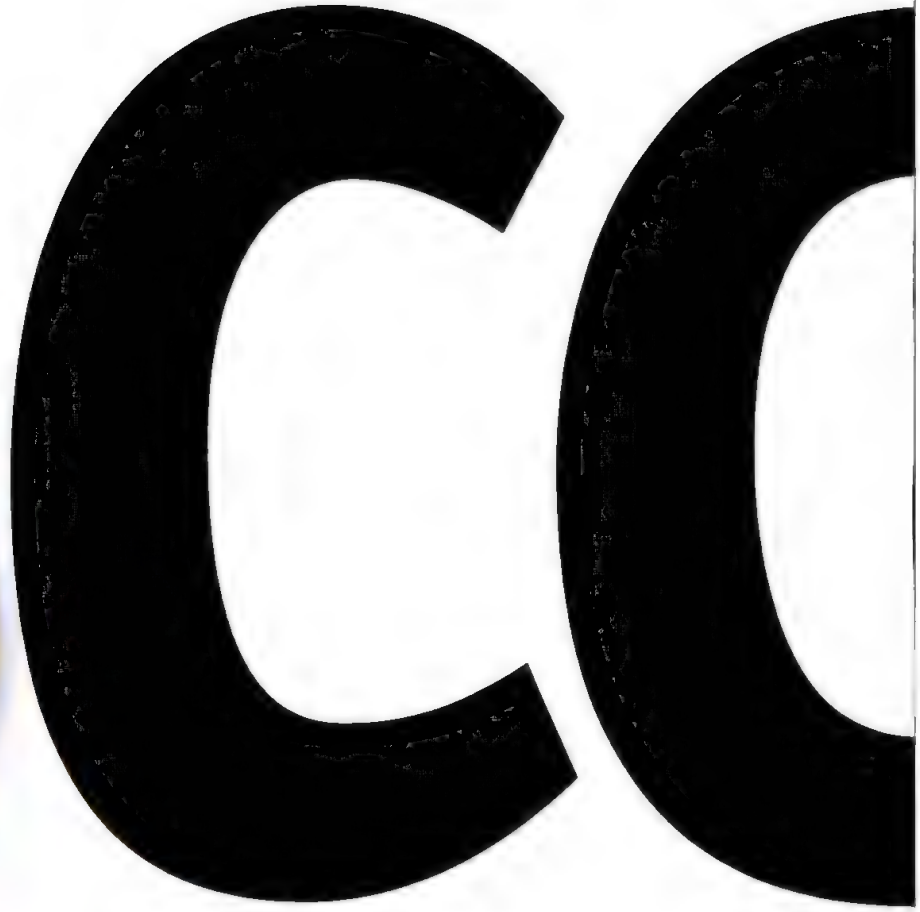


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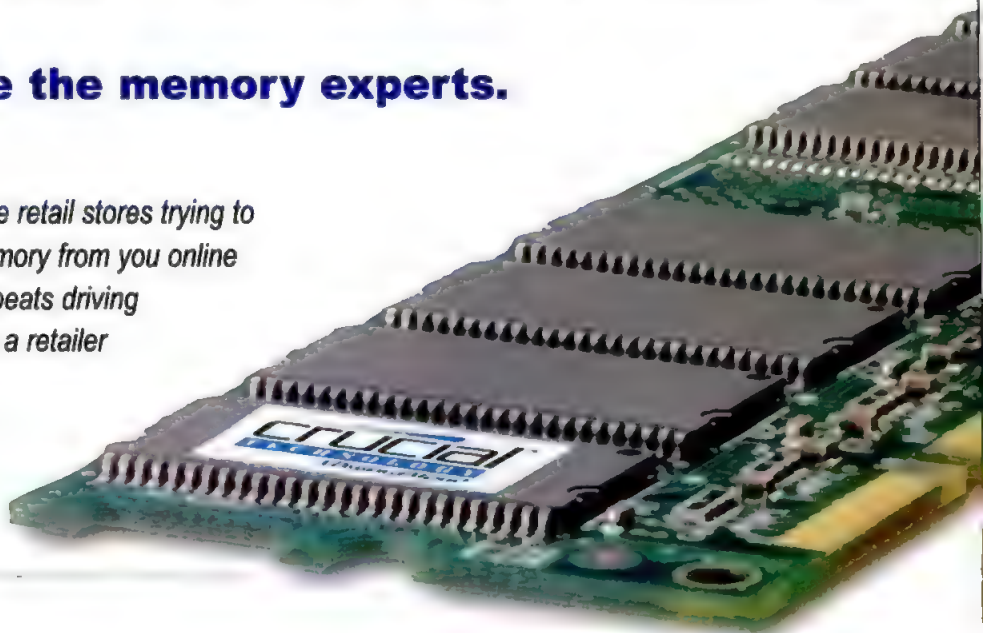
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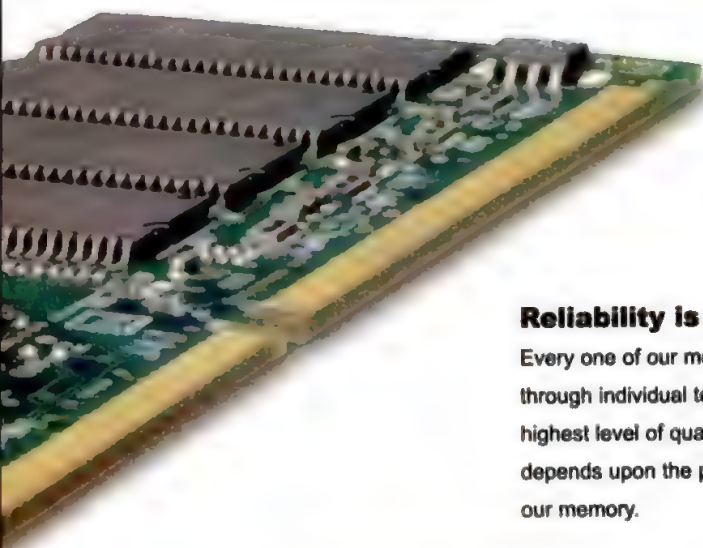
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LETTERS

BUILT FOR SPEED

Your article reviewing the new Pentium III computer systems and the benefits each vendor offers was very helpful ("Pentium III Hits 500," March 23). I did think it strange that you provided much more information about the PCs' speaker systems than about the quality of the monitors. It would be very helpful in the future if you would offer comparisons of monitors' quality, USB capability, and method of calibration. Also of interest is which vendors will be offering, in the near future, a flat-screen CRT with a USB hub at the base.

PETER P. JESELLA
Windsor, California

Your recent series of articles on the Pentium III processor begs the question of whether this new chip is a PC user's necessity. As Intel chips continue to become faster, few software applications demonstrate the need for 500-MHz-plus speeds. If and when Microsoft releases its Windows 2000 OS, that will usher in the need for the Pentium III. Windows 2000 will require a 300-MHz chip with 64MB of RAM. So guess what option is open to PC users? Upgrade or buy yet another computer! The key words for the PC industry are *spend, spend, and spend some more*. I have had to buy three new computers over the last ten years to keep up with so-called "innovations" and better software, most of which was bugware requiring endless download "fixes." At the same time, my neighbor has spent little money in keeping his Power Macintosh current, up and running. I am tired of the endless PC hassles, faulty software, and snake-oil pitches about the latest and greatest. I sold my PC and bought the new Power Macintosh G3 with a processing chip that puts Intel to shame. If only PCs were made this well!

EDWARD WEBSTER
via the Internet

I see on the cover of *PC Magazine* that Intel is threatening to speed up the computing environment with a 500-MHz chip. Something has to be done: We simply cannot let end users have a faster computing experience.

Suggestions: (1) Bloat the OS some more. For starters, we can add built-in home appliance support, full-duplex TV reception/broadcast, and uninvited helpers with each keystroke or mouse click. (2) Fatten up the apps. Word really needs a good built-in encyclopedia, including Internet auto-connection at each start-up to download the latest discoveries in all fields of research. Excel should start each session with proofs of all known mathematical theorems. (3) Graphics, graphics, graphics. Now we can afford narrated 3-D tours of each of the Seven Wonders of the World overlaid behind our daily e-mail. A warning: Do not make Plug and Play work.

It's too much fun to watch people buy add-ons that they think are actually going to function right out of the box and then hear the whimpering calls to tech support.

BRUCE DOWDY
via the Internet

KEEP YOUR SOURCE OPEN

"Software Returns to Its Source" (March 23) was an order of magnitude better than your previous Linux coverage and a good, balanced piece. Throughout, though, is evidence that the authors do not yet understand the impetus for the rise of Linux, nor do they fully comprehend the nature of the open-source movement—not surprising, given the complexity of these phenomena. Open-source is about intellectual freedom, not about free-

The key words for the PC industry are *spend, spend, and spend some more*.

ware. While the materialistic among us focus on the absence of royalties, those who love ideas and intellectual progress are more interested in the openness of the code and particularly value the diverse and loyal community that open-source ideals have engendered.

The growth of Linux is related not to its being free but to its being reliable and malleable. For a couple of years now Linux has arguably been the most stable OS. This reliability, based on sound fundamental design, has propelled it into the enterprise. By contrast, the weakness of Windows has been its unreliability and some unsound design characteristics that make it, in some ways, inherently unstable.

DANIEL L. JOHNSON
via the Internet

It's great that you are finally giving Linux a little more space. I've been on the Linux bandwagon for about six months now. I enjoyed the article and found it accurate. But I think you ignore one place where Linux fills the bill, and that's for the power user. Linux, in a dual-boot system, offers the best of both worlds. If you have to use something available only in Microsoft's world, you reboot; otherwise, Linux rules.

Linux has enough tools to perform most tasks one would do in Windows or OS/2. In many cases, Linux tools are better. For instance, Linux is my first and only choice for anything Web-related. Another area you give short shrift to is the Linux GUI. You give the impression that it's in its infancy and not ready

for prime time. Wrong! I prefer Linux with WindowMaker from a functionality standpoint and for its looks. Although there is nothing comparable to OLE yet, the Linux GUI is a rock-solid, mature, and fun environment.

HAL BURGISS
via the Internet

NOTE

Regarding the article in your Trends section entitled "Name, Rank, Serial #" (March 23): The whole concept of using a microprocessor serial number to identify a particular person is obviously flawed. The reality is that any given com-

puter can be used by more than one person, and any given person can use more than one computer. With Intel pushing newer and faster chips on us with increasing frequency and PC costs plummeting, people will be replacing their computers more and more frequently.

The processor ID cannot be used to identify a particular user of a given computer reliably. If the concept were viable, mail-order companies would use

Caller ID to verify the identity of a person making a purchase based on the phone number of the telephone being used; it doesn't work, because people can and do make purchases from any telephone in the country. The bottom line is that the processor ID is nothing more than an inventory-control mechanism, like the VIN on a car. Those seeking to use it for anything else are in for a surprise.

R. AYKROYD
via the Internet

MAKING MOVIES

Bill Howard's timely column on the Sony VAIO Digital Studio was perceptive and most welcome ("Lights! Camera! Time Sink!", March 23). I have used the Pinnacle Systems Studio 400 (and the 200 before that) and agree that it can be quickly mastered. Since I have a collection of video Hi8 tapes—some with footage professionally transferred from Super 8-mm and 16-mm film—I was intrigued by Sony's announcement of the Digital8 format in January. Weeks ago I e-mailed *Videomaker* magazine and asked the editor for comments on the Sony VAIO Digital Studio and Digital8. After reading Howard's column, I e-mailed *Videomaker* and called the editors' attention to the column, suggesting that it ought to be a model for their analyses.

FRED COLLINS
via the Internet



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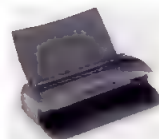
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SO TO SPEAK

Jake Kirchner says, "Personally, I think it makes sense that pornographers shouldn't have any reader access to our children online than they do offline" ("Speaking Freely, or Not," March 23). This statement is politically loaded in at least two ways. First, it is not that pornographers have access to children via the Internet, but rather that children have access to the pornographers. Children's parents give them access to the Internet. If Kirchner wants the Internet to act in loco parentis, nobody will end up satisfied, because parental criteria differ too widely. Parents can install filters and other strictures on their end. And furthermore, those are not "our" children, they are their parents' children. Kirchner may be suggesting we replace parental authority that he considers too lenient.

JAMES ENTERLINE
New York, New York

AUTHOR!

I want to compliment you on your Tutor column. I've just finished reading Alfred Poor's column on ink jet printers (March 9). In an age when there is so much poor technical writing, it is a pleasure to read a well-crafted piece. Early in my career I was a technical writer and in charge of a publication department. I appreciate good writing.

LARRY FRIEDMAN
via the Internet

BEAT THE CLOCK

The Inside PC Labs column ("Graphics Cards: A Little Means a Lot," Trends, March 23) actually caused me to chuckle. Although your magazine does some things very well, reviewing hardware has never been one of them. Overclocking of video cards by vendors has been a well-known issue for some time. Pay a visit to Anand Tech (www.anandtech.com) and Sharky

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Corrections and Amplifications

In our Inside PC Labs story "Digital Camcorders Do the Net" (Trends, April 6, 1999, page 28), we mislabeled two series of digital photos. The ones in the left column were taken with an inexpensive digital video camera; the ones on the right were taken with an expensive digital camera.

Extreme (www.sharkyextreme.com) to see their awareness of the clock-speed issue when doing a review. One of the first things they do is to check memory and core speeds versus what should be seen in production-level cards.

JIM DAVENPORT
via the Internet

WHISTLE WHILE YOU NETWORK

Regarding your Trends article "High-Bandwidth Options: ADSL vs. Cable" (March 23): I was taken aback to see that one of the prominent negative points for ADSL was that it is not networkable. Not only is this not true, it doesn't make much sense. Any decent ISP offering ADSL will assign you a permanent unique Internet IP address, and at the ISP where I work, customers are given the option of purchasing an entire subnet of unique Internet IPs. This is the very essence of networkable. I can't think of any type of Internet connection that is not networkable.

JOHN RICHARDSON
Dallas, Texas

As we stated in the original article, ADSL services vary significantly by service provider and location. Although it is technically possible to network ADSL, BellSouth's Acceptable Use policy prohibits sharing (for details, go to www.bellsouth.net/legal/acceptable_use_policy.html). According to BellSouth's legal department, the company will terminate an account if this policy is violated.—Ed.

MAKE MINE SYMMETRIC

In the course of business, my clients and I regularly exchange files: reports, databases, software, and so on. These can be as large as 20MB, and no doubt they'll get bigger over time. The total amount of traffic and the economics of our businesses do not allow for the cost of leased lines or virtual networks, so we rely on dial-up access to the Internet. This kind of traffic works best with symmetric access speeds, yet all the newest developments such as cable, satellites, and ADSL are moving toward large-differential asymmetry. Are we voices crying in the wilderness?

IAN MARTYN
via the Internet

JOG YOUR MEMORY

If, as you say, "a memory upgrade is still the most effective way to increase your general performance" (and it is), then why was it given the least amount of coverage in an otherwise excellent article ("The Ultimate Upgrade Guide," March 9)? The section on mother-

boards was outstanding (the step-by-step how-to with graphics, the "Upgrade Tips" sidebar, the Editors' Hot Links, and so on), but what percentage of your readers are going to replace their motherboards versus adding memory? As a long-time subscriber (you knew I'd work that in), I think that's something you should have addressed in the piece.

KEN JETT
via the Internet

SOUND OF THE BEEP

In "VCRs Take a Spin" (Pipeline, March 9), you suggest that a Replay or TiVo unit is just the thing to prevent one from missing the end of the World Series because the phone rings. I can recommend a device that serves a similar function, has no monthly fee, and costs considerably less than \$700. It's called an answering machine.

JENNIFER CAVEN
Freeport, Maine

FAIR SHARE

Regarding the letter from Hugo Furth (Letters, February 23): Mr. Furth complains about the proprietary nature of the hard disks installed in the Compaq Deskpro series of computers. He contends that they are not swappable into other systems with standard BIOS programs and that this means they should not be used as corporate PCs. In fact, that is why they make the best corporate PCs. It is well known that the single biggest point of failure on any computer is the hard disk. The hard disks that come in the Deskpro series cannot be installed into any other kind of PC; they can, however, be installed on other Deskpros. A corporate PC is chosen as a standard and then purchased for many users in a company so that there is always an identical unit in which to put a hard disk should a computer suffer a processor failure.

BENJAMIN A. RUDNICK
Woburn, Massachusetts

WHAT'S THE MEANING OF THIS?

In "Shoot Like the Pros" (First Looks, February 9, page 48), you used the word *prosumer*. I was not able to find it in any dictionary, including the big Oxford. What does it mean? Where did it come from?

ALEXANDER SPERLESCU
via the Internet

We define prosumer as "professional consumer." As far as we can discover, the word hasn't found its way into the dictionaries yet, but it's used especially in regard to savvy consumers of electronic equipment.—Ed.

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Software for Rent

The growing trend toward renting applications and outsourcing IT services lets companies focus on their core businesses.

Should an ice cream company spend time and money to maintain a complex e-mail system? Does a dress manufacturer really need to know the ins and outs of IT infrastructure? As networking technology becomes an increasingly complex animal, more and more people are saying no, and they're turning to outside companies to provide for their technology needs in much the same way they turn to utility companies for phone service, gas, and electricity needs.

In turn, a growing number of outsourcing companies have materialized recently to provide everything from office applications and e-mail systems to entire corporate networks. These vendors host services from centrally managed facilities using the Internet as a connection between clients and the applications they want to reach.

And the outsourcing market is booming, with worldwide spending on outsourcing services reaching \$89 billion in 1997 and expected to reach \$142 billion by 2002, according to market research firm IDC. Corporate spending on outsourcing services in the U.S. alone accounts for over half the market. U.S. spending reached \$47 billion in 1997 and is expected to reach \$75 billion by 2002.

What's the attraction? "Partnering with outsourcing vendors allows companies to focus on their core competencies," says Cynthia Murphy, a senior analyst at market research firm IDC. The closer and tighter alignment of companies' business and IT strategies has changed the face of outsourcing, which used to consist mainly of long-term multiyear deals with no profit in the short term for outsourcing vendors, says Allie Young, an analyst at Dataquest. "Now outsourcing vendors understand your business goals and work to improve your technology as it applies to your business."

Among the newly hatched outsourcing com-



panies, FutureLink Distribution bills itself as a computer utility service targeting companies from 10 to 1,000 employees. Customers access via the Internet applications and data on FutureLink's server farm. The core service includes a Windows terminal to the desktop, Internet access, Office 97, and Web browser software. The company also offers Java-based productivity and e-commerce applications as well as Win NT-based management software.

Sage Networks' Interliant AppsOnline, a catalog of software for hire on the Internet, provides round-the-clock remote access to Lotus

Domino and Notes applications as well as customized network application services for the legal, pharmaceutical, and education markets. CORIO, another application service provider, hosts enterprise resource planning, sales force automation, and electronic commerce software.

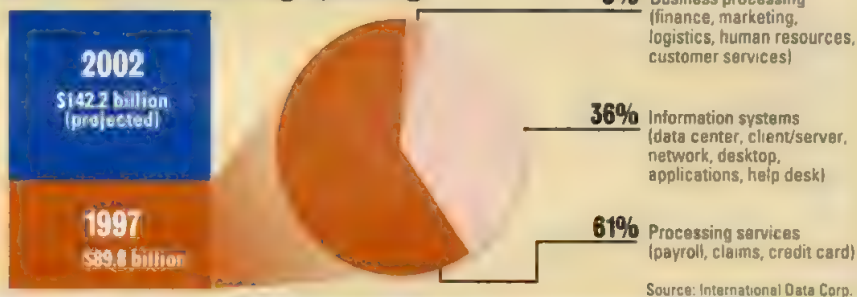
Dealing with the messaging needs of even a small organization can be a big headache. To alleviate the pain, Netscape has teamed up with several ISPs, including Verio and Nextel, to provide messaging services to their business customers. Interpath Communications is also using Netscape products in its business e-mail services.

Billing itself as "The Internet Post Office," USA.NET offers free, advertising-based e-mail service for consumers and corporate customers. In addition to standard e-mail services, the company has mail-management services for handling user accounts, address books, and junk-mail blocking.

"Outsourcing e-mail allows companies to maintain control of the process without taking them away from their main business," says Judie Hayes, vice president at Critical Path, another e-mail service provider. She adds that outsourced e-mail will move toward premium services such as unified messaging, calendaring, guaranteed delivery, and digital certificates.

The application service industry has gotten off to a promising start. Nevertheless, Cameron Chell, CEO of FutureLink, says that the short-term prospects are full of hazards. "The industry will be highly fragmented with hundreds of new start-ups and hundreds of ISPs participating, thinking that this is an easy business," he says. "Industry credibility and standards have to be set, and successful deployments have to demonstrate higher-quality service and a lower cost of ownership." — Sharon Nash

Worldwide Outsourcing Spending



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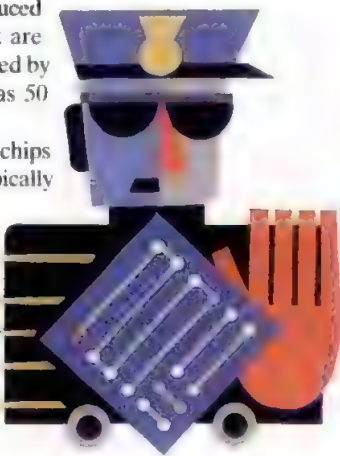
Chips Caught Speeding

Think you've got the fastest microprocessor on the block? If so, it just might be a chip altered to run faster than intended. Intel recently made a new software utility available on its Web site to identify these altered, or *remarked* chips.

Intel's new Processor Frequency ID utility is designed to quantify the speed (clock speed, measured in megahertz) of Pentium III processors and inform PC buyers of current chip speed. The utility does this by interfacing with the self-check logic built directly into a Pentium III chip's silicon as the chip runs. Among other things, the utility can catch an *overclocked* processor—one rigged to run at a faster clock speed than is recommended.

In the past, *PC Magazine* has frequently run into overclocked computers sent for benchmark tests (our benchmark tests catch this). These efforts at chip modification can result in problems with reliability, and they void Intel's warranties. In announcing Intel's new utility, forensic specialists from Intel have produced chips that are overclocked by as much as 50 percent.

Forged chips have typically



not been a problem when dealing with leading vendors such as Dell, Compaq, and IBM. More often, they are seen in systems from smaller companies with less solid brand names.

What's in it for the companies who accelerate processor speeds? Faster machines mean higher prices. But the consumer who buys an overclocked system is taking warranty and reliability risks. On the other hand, some users want to advance the clock speeds on their computers. Intel's new utility doesn't stand in the way of that.

The new Processor Frequency ID utility will work only with the new Pentium III chip, although Intel intends to continue making similar utilities available for future generations of chips.—*Sebastian Rupley*



During testing for our recent comparative roundup of five Pentium II Xeon-based servers ("Enterprise Servers," April 20, 1999), PC Magazine Labs encountered the highest ZD ServerBench performance tests scores we'd seen at the time, with one exception. The Hitachi VisionBase 8460 server exhibited anomalous test scores that didn't display the full potential of the server.

After consulting with Hitachi and Intel engineers, PC Labs identified the hard disk subsystem as the culprit, tuned it accordingly, and the test scores then closely matched the performance scores of the competitors. Here's how we went about tuning the server to get the best performance possible.

Although neither Hitachi engineers nor PC Labs was able to remedy the situation in time for our deadline, we continued to investigate the problem. For the ServerBench 4.02 test, which simulates client/server environments, good performance depends on the client workload that's cached into the server's system memory before the test begins. If the disk subsystem doesn't feed data to system memory in the allotted time—known as the ServerBench ramp-up time parameter—the test will operate partly from cache and partly from disk, dragging down the ServerBench scores. A look at the original scores of the Hitachi server indicated that the poor performance could have been due to the slowdown in the server's disk subsystem.

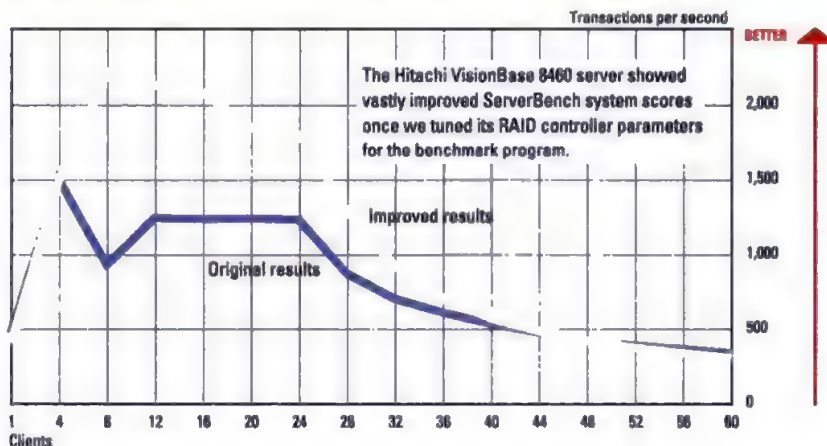
To confirm our suspicions, we monitored Windows NT's cache status while the test ran and observed that the Hitachi server was caching far less data than the other servers by the time the test run started. When we ran

ServerBench with a custom suite that allowed more time for data to become cached, the Hitachi's results climbed back up. This supported our hypothesis that a misbehaving hard-disk subsystem was dragging down performance.

Hitachi engineers visited PC Labs to troubleshoot the problem. They swapped out the network interface cards, RAID controller, disk array, and the system itself to determine whether any of those components contributed to the poor performance. Still, the test results didn't change much.

Following advice from Intel engineers, we tried changing the stripe size parameter—the size of a single I/O operation—of the Mylex eXtremeRAID 1100 controller from the default of 64K to 8K, and performance improved. Changing stripe size affects ServerBench test results, because as with any network application, the disk parameters need to be optimized. Since different applications generate different kinds of load on servers, you should have a good idea of the kind of load your applications will generate. Servers provide such tuning knobs for a reason, and all or most of them should be set to get the most performance from your server for the particular application it's running.

Before reconfiguration, Hitachi's VisionBase 8460 server used a 64K stripe size, which isn't the best setting for the type of load ServerBench puts on the disk subsystem—mostly small (2K), random reads. Large stripe sizes provide better performance for large, sequential (as opposed to random) transfers; the new setting of 8K for the stripe size resulted in better performance for ServerBench's smaller, random transfers.—*Russ Iwanchuk*



DATABASES

Audio Mining

Call most any customer-service operation and you'll hear the message, "This conversation may be recorded for quality-assurance purposes." Those hours upon hours of conversations with customers are replete with juicy information companies can use to improve their businesses, yet turning those audio recordings into a useful format that can be probed to reveal meaningful information and patterns is no easy task. Enter AudioMining, a technology that software developer Dragon Systems has come up with for creating a keyword index of spoken words from within volumes of recorded audio, eliminating the need to listen for hours to pinpoint information.

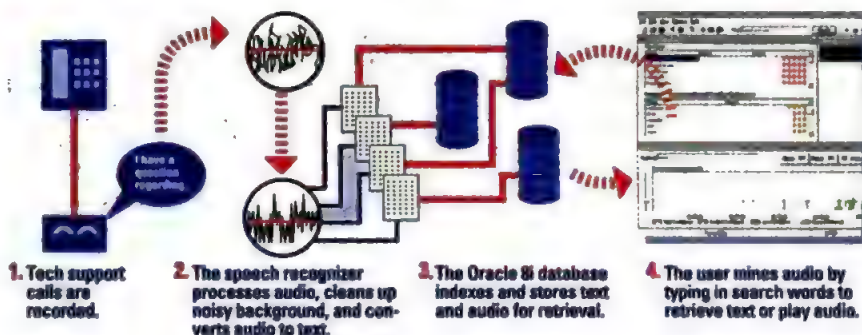
Companies can generate searchable text that's indexed to a time code on the recorded media, so users can call up text or jump

right to the audio clip containing the specified search word.

Dragon designed the software to work in the most demanding environment for a recognition engine, where the background is noisy, the phone connection may be unclear, and the speakers are many. According to Dragon, the speaker-independent recognition engine is able to separate two speakers talking at once. Dragon and Oracle recently struck a deal to include AudioMining technology in the Ora-

cle 8i database. Dragon is also working on its own audio database.

While Dragon is tuning into the audio portion of databases, software developer Virage is focusing on the video. Virage's VideoLogger is a video indexing system that extracts textual data (SMPTE time codes, lineup files, and closed captions) and synchronizes the text to keyframes. In a joint development with IBM, VideoLogger will use speech recognition to convert spoken words into text. —Carol Levin



Y2K: Someone's Gotta Pay

The other day I left work in the evening and walked to a midtown Manhattan hotel to meet someone for a business dinner. When he finally showed up in the lobby, he said he had been trapped in a stalled elevator for half an hour. Hotel functionaries, clearly worried about a possible lawsuit, fawned around him, offering freebies of every kind as compensation. But he had no intention of suing the hotel for the inconvenience, which was really nothing more than a major annoyance.

I was thinking about his experience a few days later when I read about a major New York suburban hospital losing all power for almost an hour. When the power went out, the hospital's two backup generators failed to start. For 47 minutes, nurses and doctors scrambled to keep newborns and post-operative patients alive in intensive care units, orderlies used kitchen ice to protect blood supplies, and doctors completed two surgeries by flashlight. Fortunately no one was harmed. But as the hospital blamed the power company and the power company pointed fingers at the hospital's backup snafu, you could almost hear the sound of lawyers racing to the courthouse to file lawsuits.

"This," I thought, "is what Y2K hell is going to be like."

The signs are already there. Dozens of class action lawsuits involving Y2K claims have been filed around the country. In response, more than a hundred state-level bills to limit Y2K litigation have been introduced, and the U.S. Senate and House of Representatives are already debating several such measures. A broad coalition of business groups, particularly those representing information technology companies, is lobbying for legislation to limit their financial responsibility for bringing systems into Y2K

compliance and their legal liability when and if systems failures cause harm to people or disruption of services. Consumer groups and the Association of Trial Lawyers—the folks who end up litigating these kinds of cases—are understandably opposed to limits on punitive awards.

Y2K lawsuits may end up costing more than \$1 trillion, according to a Senate report. That's a big number. But not that big when you consider that the cost of preparing systems for the Year 2000 rollover may amount to hundreds of billions of dollars. And that doesn't factor in the damage or losses that might occur through systems that aren't fixed in time. Someone's got to pay for all that. And you can bet it won't be just insurance companies, whose resources could be quickly overwhelmed absent some legislative relief.

There's a bit of good news on the Y2K front. The Senate special committee on the topic reported recently that the financial, transportation, and utilities industries are in reasonably good shape. (The report is available at www.access.gpo.gov/congress/senate/sp106-10.html.) The bad news is that one of the worst-prepared segments of our economy is the health care industry. And we know that personal injury lawsuits are the nastiest and most expensive.

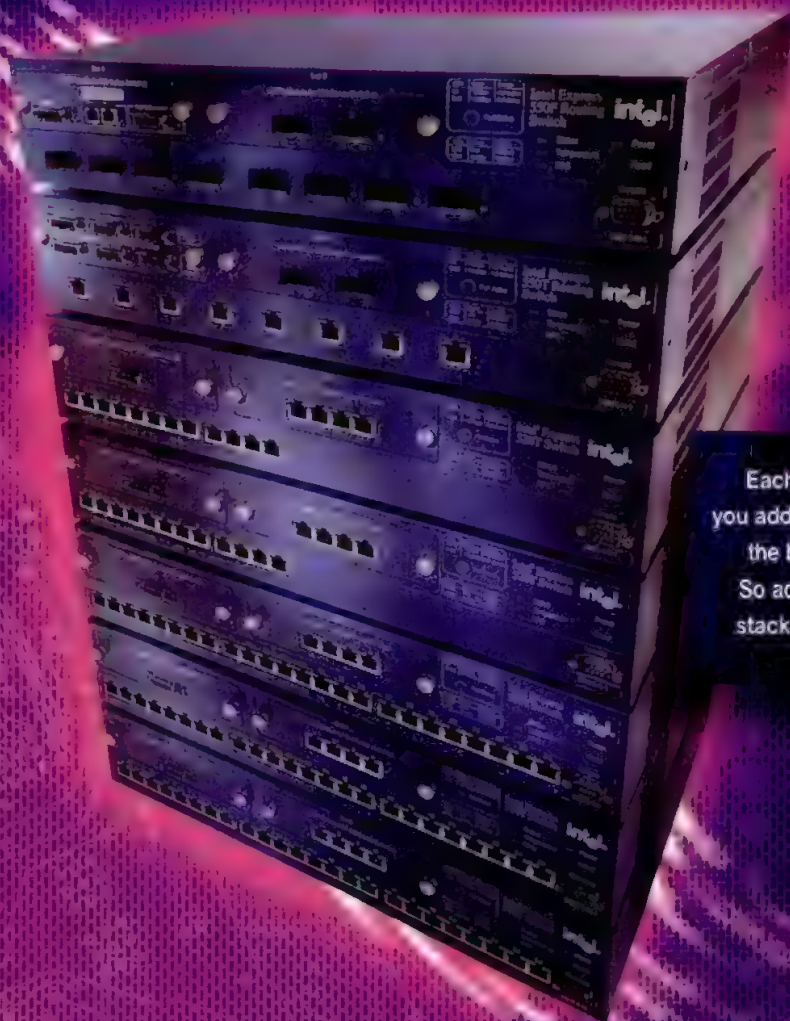
My prediction: Congress will indeed pass a bipartisan compromise bill limiting Y2K lawsuits and liability judgments. Congress won't let the worst offenders completely off the hook, but it will prevent Y2K litigation from clogging our courts for the next 20 years. While it's tempting to drag into court any vendor that has sold non-Y2K-compliant systems, it's also true most vendors will be more likely to offer fixes if they have some protection from extensive liability. I'd like to see some of those fixes offered for free, but all things considered it does make sense to have some limits on this kind of litigation.



Jake Kirchner

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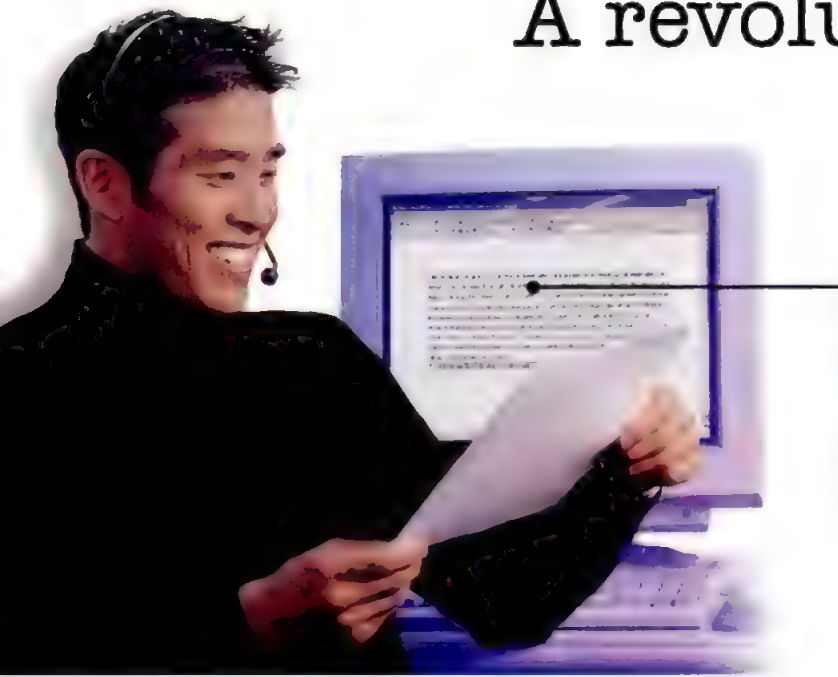
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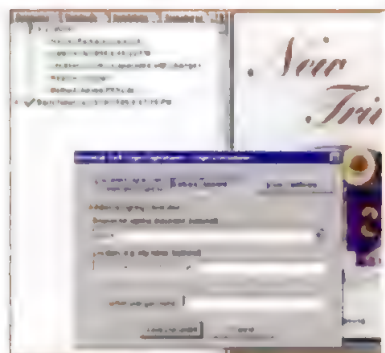


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PORTABLE DOCUMENTS

Adobe Acrobat 4.0 Preview

The Adobe PDF format is the de facto portable document format, enabling the electronic distribution of a visually accurate representation of a document, with fonts, graphics, and the layout intact. But it hasn't offered robust group authoring tools. All that changes with Acrobat 4.0. Due to ship in the second quarter of this year, Acrobat 4.0 adds long-sought annotation and editing tools that were previously available only as third-party plug-ins. In addition to sticky notes, it offers robust markup tools such as text highlighting and recorded voice comments. The new text-editing tools let you fix misspellings without regenerating the PDF file. You can also reuse PDF text and tables by cutting and pasting the data into other applications. We were particularly impressed with the digital signatures, both for their authentication features and their ability to track and restore iterations of a PDF file. Surprisingly, digital signatures and the ability to capture HTML pages are available only on the Windows platform, but Adobe has promised Macintosh users a speedy update. Adobe assures us that the one serious glitch we encountered—aborted print jobs—will be fixed by ship time. So we're giving Acrobat 4.0 a thumbs-up.—*Luisa Simone*

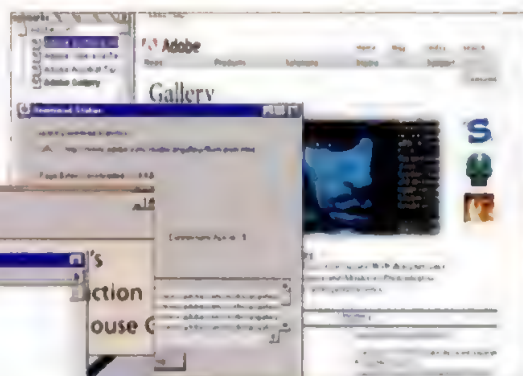


Digital signatures add a new level of security to PDF files, because the password-protected, encrypted signature can be certified as authentic.



Acrobat's revamped interface includes a toolbar with a Navigator tool that lets you pan and zoom the current page (far right).

The Touchup Text tool lets you perform simple edits, such as correcting the misspelled word shown here, as well as changing the font, point size, alignment, tracking, and kerning.

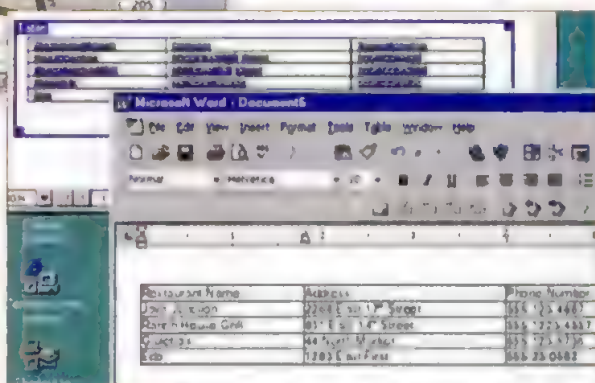


Point Acrobat to a Web site and it can capture HTML pages as PDF files.

A new smart text-selection tool lets you copy data from a PDF file for use in other applications—like the Microsoft Word document shown here.



New annotation tools let you add comments in the form of stamps, highlighted text, drawn elements, and sound clips, and they let you identify the author of each annotation.



PC Shopping

By Cade Metz



Most major PC manufacturers now sell their desktops, notebooks, workstations, peripherals, and even servers over the Web. The success of Dell and Gateway—pioneers of direct selling—has forced PC companies to overhaul their business models and cut out, at least in part, the traditional middlemen. After all, the Web is the most unassuming and efficient of middlemen, letting you quickly and painlessly purchase a PC and—if need be—upgrade or repair that PC as well. Here are the best sites to help you with all of those tasks.

Buy PCs and Peripherals

➤ No one makes it easier to buy a system or a peripheral online than Dell Computer, the first PC company to add the Web to its direct sales model. In addition to detailing each of the company's product lines and services, Dell's Web site (www.dell.com) links to five separate subsites, each for a different type of buyer. After jumping to the appropriate page—Small Business, Large Business, Education, Home, or Government—you can then choose the system or peripheral that suits your needs, access a list of its basic components, and adjust those components to better suit you.

Should you wish to buy in bulk, Dell's virtual shopping cart lets you easily increase and decrease the total number of systems you wish to buy. Sites from Compaq (www.compaq.com), from IBM (www.ibm.com), and from Micron (www.micronpc.com) are comparable to Dell's—offering custom configuration wizards and shopping carts—but they have fewer explanatory links and are generally more difficult to use. Less proficient though still favorable sites are provided by other well-known business vendors, such as NEC (www.nec-computers.com) and Quantex (www.quantex.com). Gateway's site (www.gateway.com) is one of the least friendly, forgoing the shopping-cart model and making it quite easy to order the wrong system accidentally.

If you want to save a few extra dollars, you can also shop at third-party sites such as PC Mall (www.pcmall.com) or PC Connection (www.pcconnection.com). Each sells complete systems, but we recommend purchasing your PC straight from the manufacturer and then going to a third-party site for inexpensive peripherals.

Lease Systems

➤ Many of the major PC vendors, most notably Compaq and Dell, also let you lease computer hardware online. Both not only describe multiple leasing options in

detail—again according to what type of buyer you are—but also integrate leasing into the shopping process. After you've custom configured a system and keyed in your shipping information, a page gives you the option of leasing or buying. Compaq's site asks you to fill out a brief application if you decide to lease, but it too is quick and painless.

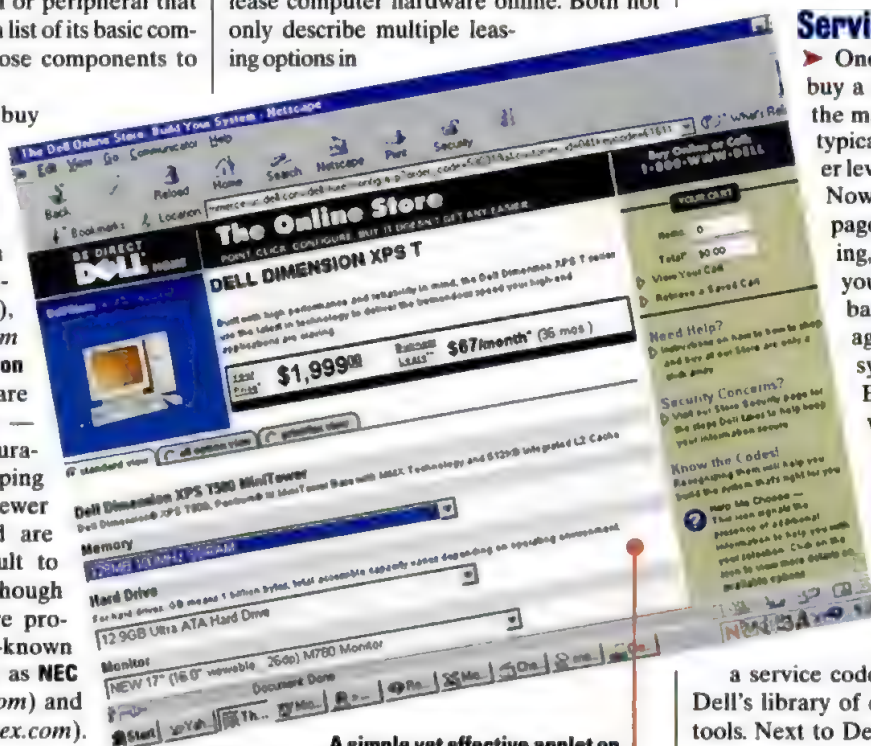
Comparison Shop

➤ If you're unsure of which PC vendor to buy from or wish to find the lowest available price for a particular product, you can comparison shop at such sites as ZDNet's computershopper.com (www.computershopper.com), run by our parent company, Ziff-Davis) or PriceSCAN (www.pricescan.com) before moving on to sites that actually sell PCs. Via a set of pull-down menus, these sites first ask you to enter myriad details about the type of system or peripheral you're looking for, including preferred manufacturer, minimum speed or bandwidth, and maximum price. Then they load a list of products that come closest to meeting your description and point you to the URLs where those products are sold.

Service PCs

➤ One of the best reasons to buy a PC directly from one of the major vendors is that they typically provide a much higher level of service and support. Nowadays, this includes Web pages dedicated to maintaining, upgrading, and repairing your PC. The leader in Web-based help tools is, once again, Dell. Each new Dell system ships with an Express Service Code, which when keyed into Dell's support site, affords access to innumerable BIOS updates, drivers, manuals, troubleshooting wizards, and diagnostics specific to your hardware. Even if you don't have

a service code, you can easily browse Dell's library of documentation and help tools. Next to Dell's site, the best site for vendor-specific service and support is Gateway, whose troubleshooting wizard is particularly impressive. Compaq and Micron lack such a wizard but otherwise offer exemplary hardware support. **PC**



A simple yet effective applet on Dell's Web site lets you custom configure your new PC using a series of pull-down menus that list various components. The applet has many imitators, but no one does it better.



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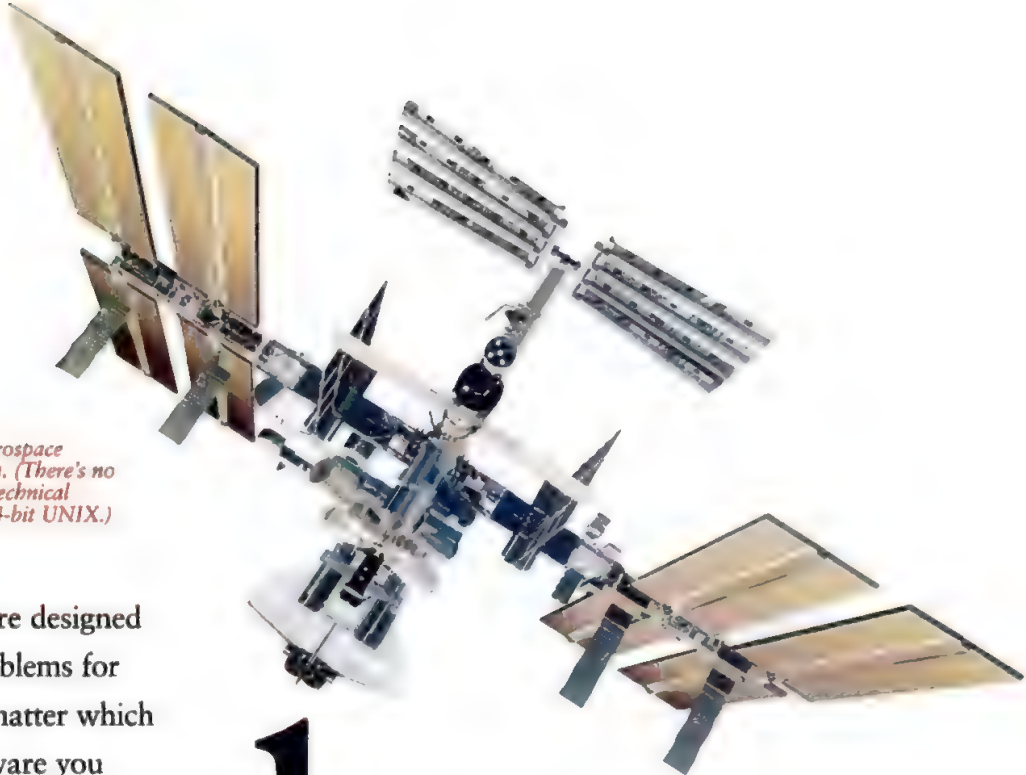
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Your Videos—Online

Easy-to-use, affordable video publishing software is now available for both home and corporate use. PC Magazine Labs tests four packages.

By Jan Ozer

Increasing bandwidth and advances in streaming technology make the Internet extremely fertile ground for publishing video productions of all kinds—from short training videos to customer testimonials to little Johnny's first birthday party. And now, you don't have to be a film student or a digital video guru to create a video with both

Ulead Systems (VideoStudio 3.0), the developer of high-end editor MediaStudio. Joining these three companies is MGI Software, whose VideoWave II is an updated version of a previous *PC Magazine Editors' Choice* (The Complete Video Desktop, October 7, 1997).

WHICH PACKAGE TO CHOOSE

So how do you choose the product that's right for you? First

If you want a bundled solution, you should assess your filmmaking and technical experience and determine where you need the most help. Total novices on both fronts should consider our Editors' Choice in this roundup, Avid Cinema, which provides templates to help you film and edit and uses simple, jargon-free controls for all production steps. But keep in mind that Cinema offers fewer features and less editing precision than many other products. (For complete information on bundled solutions, consult each vendor's Web site.)

The next factor to consider is how you plan to distribute your movies. If the Internet is your target, both Cinema and VideoStudio can output in RealVideo format. VideoStudio supports Microsoft's Advanced Streaming Format (ASF) as well, so it offers the greatest flexibility.

Though all four products in this roundup output in CD-ROM-compatible formats, Pinnacle Systems' MP10, a real-time MPEG-1 encoder, is particularly well suited for CD-ROM productions.

Similarly, though all products we reviewed can output video back to tape for VHS distribution, VideoWave is limited to productions of about 10 minutes (unless quality is reduced); the others can produce much longer movies. That said, VideoWave offers the broadest feature set and was the only pro-

artistic and technical merit.

That's due to a renewed focus on easy-to-use, affordable products for both corporate and home use. Previously, this category attracted developers with little video experience, but the allure of a potential mass market has attracted such heavyweights as Avid Technology (Cinema) and Pinnacle Systems (MP10), each with several technical Emmy awards to their credit; along with

ask yourself whether you are searching for an easy-to-use program to work with an existing video capture card or seeking a new bundled solution. If the former is true, VideoWave II is almost certainly your best solution, since it's compatible with the broadest range of video capture cards.

A NEW ENVIRONMENT:

Novices and experts alike can build a better Web page with IBM NetObjects TopPage. Page 60.



A SAFER DESKTOP:

The HP Vectra VL8 MT protects your PC beyond the level of a password solution. Page 71.



DO IT ALL:

Use Technauts' new eServer 152-E for easy Web, e-mail, print,



and file services in one box. Page 75.

More Products Reviewed

Micrografx iGrafx.....	48
Simply Postage.....	49
MetaCreations Headline Studio 1.0.....	49
Casio Cassiopeia E-15.....	53
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Living Album 99 Pro.....	57
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Axis StorPoint CD E100.....	77

More Reviews Online

- Franklin Planner 7.0
- FontLab 3.0
- Zero Administration Client 2001

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duct in this roundup to complete all phases of our test project successfully.

Each of the four video editors reviewed here offers a unique amalgam of features and usability challenges. Although no one product is right for everyone, one is likely right for you.

card, though, as we experienced instability with one of the supposedly compatible cards listed at Avid's Web site.)

Cinema's tabbed interface logically represents the production cycle, starting with storyboard templates that contain suggested shots for filming a range of corporate and fami-

Cinema provides over 60 transitions, but edges were noticeably pixelated, especially on diagonal lines. All effects render when set, so you can preview your production at any time—a great feature.

You can record or load narration and background tracks and fade all audio clips in and out. You can't fade titles in and out, however, or overlay graphics over video files—the only two specs on our test project that Cinema couldn't handle.

When you're ready to output, you select among such options as Save Movie to Videotape, Save Movie for CD-ROM, or Save Movie for the Internet. Beyond broad decisions like 2X or 4X CD-ROM, you typically can't access any other encoding parameters, which is ideal for beginners. The only exception is RealMedia output, which uses the same encoding wizard found on Real's Level 5.0 Producer products, including the ability to create and publish a Web page.

Whatever the output medium, Cinema first renders all titles and then reads the video from the timeline and encodes directly to the final format without creating an intermediate file. This reduces disk space requirements, speeds production, and enables Cinema to avoid Windows' 2GB AVI file-size limitation, so you can build productions of virtually any length.

Cinema works only with specific capture cards listed on Avid's Web site, but it proved unstable with the ATI All-In-Wonder Pro, a board it supposedly supports. Cinema was very reliable with the Matrox Marvel G200-TV, however. (Cinema is sold either as a software-only ver-

sion, which works with the capture cards listed in our fact file, as a separate version bundled with the Matrox card for \$330 street, which works only with the Matrox card.)

If you can't build a movie in Avid Cinema, you should hang up your camcorder and take up knitting. The only significant downsides to this program are limited compatibility and the cost of technical support (\$14.95 per incident).

MGI VideoWave II

Despite flashes of editing brilliance, MGI Software's VideoWave II (\$100 street) has surprising gaps in ease of use and functionality. This is a disappointing result for a product that owned the consumer video-editing category a scant two years ago.

Three main windows make up VideoWave's interface: A quarter-screen video window for capture and editing, a library for assets and canned effects, and a story-

INSTANT GRATIFICATION: Avid Cinema's simple interface renders all transitions when applied, enabling real-time preview and great responsiveness.

How We Tested

Our tests involved two video projects. The first was a short video we first created in Adobe Premiere, a full-feature video editor; from scenes shot at last year's PC Magazine Technical Excellence Awards ceremony in Las Vegas.

The 65-second video contains two bitmapped titles and five short clips from various speakers. Effects include dissolve transitions between clips, fade in and fade out, titles for each speaker that fade in and out, a background music track, overlaying of the PC Magazine logo over the video, and audio cross-fades between transitions.

We then attempted to create that same video in each editor, noting which features were not available, testing each with the ATI All-In-Wonder Pro, the Matrox Marvel G200-TV, and the Osprey-100 (which was incompatible with Cinema) capture cards. We rendered the clip for both CD-ROM distribution and Internet distribution and assessed video and audio quality.

To test transition quality, we created a synthetic video composed of alternating blue and red bitmaps, with transitions between the clips. Though all editors offer a different range of transitions, we focused on effects with diagonal or circular components that typically highlight stair-stepped, aliasing artifacts. We then rendered the video and compared edge quality among the various editors.

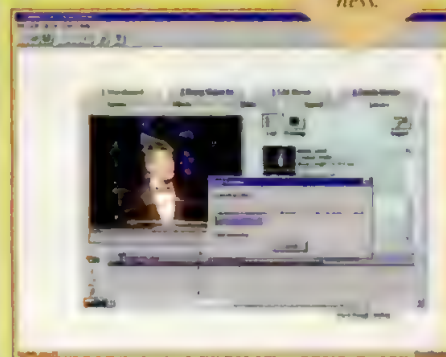
Avid Cinema



From its canned templates to its jargon-free output controls, Avid Cinema (\$140 street) helps total novices produce movies with both technical and artistic merit, with complete support for Web, CD-ROM, and tape-based distribution. This product is our Editors' Choice in this roundup, because it did the best job of handling the four basic functions of video publishing—planning, capturing, editing, and rendering. (We recommend buying Cinema bundled with the Matrox Marvel G200-TV capture

ly videos. After filming comes video capture, which features an exceptionally easy-to-use interface; then on to editing.

Though a model of simplicity, Cinema's lack of precision editing tools may frustrate many producers. The screen has three main components: A preview window, a context-sensitive control area, and a timeline with tracks for video, narration, background audio, and titles. Captured clips load on the timeline in order, and you adjust clip duration with handles that appear when you touch the clip. But there are no frame numbers, time codes, or guides of any sort, which complicates precise edits.



Avid Cinema

Street price: \$140

Requires: 32MB RAM, 1GB hard disk space, Windows 95 OSR2 or Windows 98, video capture card. Works only with ATI All-In-Wonder, All-in-Wonder Pro, Hauppauge WinTV Model 404, STB TV PCI, Intel Smart Video Recorder III. Avid Technology Inc., Tewksbury, MA; 800-949-2843

www.avidcinema.com

board on top for component clips and transitions. You rotate through the production steps by clicking icons next to the video window, which spawns context-sensitive controls.

VideoWave can capture video and still-image files from all AVI-compatible capture cards. Though MGI claims compatibility with all DV capture cards based on the Adaptec chip set, the program did not recognize our DPS Spark card, even after we worked with MGI's technical support to try to fix the problem.

VideoWave proved extremely feature rich and was the only editor that performed all tasks on our test project, including graphic overlay. Other features not found in most other programs include color and brightness adjustments and a range of special effects such as swirls and posterization.

Most editing functions include helpful preset options, such as text motion and font effects and a range of color adjustment. You can vary most effects over time and easily

move items such as text and overlays into, around, and out of the screen.

The lack of a timeline hindered effects that last over several segments, such as our background audio track, and VideoWave can't preview video in real time, even after several previous attempts, whereas other editors build temporary files to enable real-time preview and accelerate final rendering. But the program's most serious limitations relate to final output controls, which require both functional and interface redesign.

For example, VideoWave must render video files before writing back to tape, limiting most tape-bound productions to 2GB in size, or about 10 minutes of video (though you can make longer movies by reducing quality).

Though unambitious, this technique lets VideoWave work well with most AVI capture cards, where the advanced techniques used by VideoStudio and Cinema to produce movies of unlimited duration typically require custom drivers.

But to work with VideoWave at all, you'll have to

VERSATILE
MGI VideoWave II proved extremely feature-rich: It was the only editor capable of overlaying PC Magazine's logo over our demo video.



MGI VideoWave II

Street price: \$100

Requires: 32MB RAM; 45MB hard disk space for program, 1GB for workspace; Windows 95, 98, or NT 4.0; video capture card.

MGI Software,
Richmond Hill, Ontario, Canada;
888-644-7638
www.mgisoft.com

Editors' Choice

• Avid Cinema



Video projects involve two main hurdles: shaping a mass of footage into a video worth watching and working through a potentially mind-numbing mass of arcane capture and encoding parameters to create the actual video. Only Avid Cinema helps on both fronts.

Cinema is the only editor here that provides templates for a number of common video projects such as birthday parties and customer testimonials. These templates describe which scenes to shoot, how to shoot them, and also how to weave the story artistically with transitions and background music. The result is a polished presentation that most users can achieve.

Cinema also directs all capture and output activities in plain English. You capture at best or good quality and output for CD-ROM or the Internet. Behind the scenes, Cinema makes all the technical decisions for you.

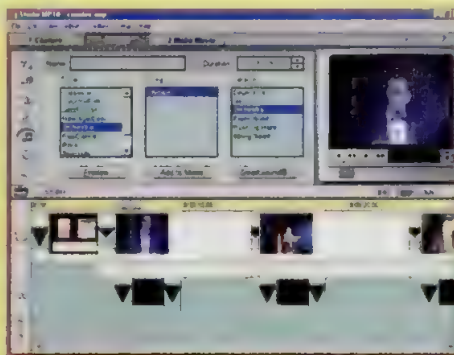
Cinema is also reasonably feature-rich, and the program can create movies of virtually unlimited length. The only caveat is that it works most reliably when tightly coupled with a capture card, so your best option is to purchase Avid Cinema in a bundle with a capture card.

negotiate through a minefield of templates that produce video poorly suited to its prescribed purpose, as well as confusing and often incorrectly described compression controls that would con-

found experts, much less the beginners for whom the product is targeted. On the plus side, if you can solve the riddles in VideoWave's interface, you'll be rewarded by consistently high-quality audio/video output.

To some degree, VideoWave's limitations are also strengths, as the product's failure to address Windows' 2GB limitation ensures compatibility

ADD SOME TUNES: Pinnacle Studio's SmartSound feature lets you create background music for your projects.



Pinnacle Systems MP10

Street price: \$270

Requires: 32MB RAM, 30MB hard disk space, Windows 95 or 98. Pinnacle Systems Inc., Mountain View, CA;

888-484-3366
www.pinnaclesys.com

ty with most Windows capture cards. On the other hand, the rendering-interface challenges have no redeeming value and represent a significant obstacle to anyone using this program.

Pinnacle Systems MP10

An inexpensive combination of a video editor and an external MPEG-1 encoder, Pinnacle Systems' MP10 (\$270 street) is a

great solution for MPEG-1 publishers. But those creating tape-based video projects or publishing digitally in AVI, RealVideo, or ASF formats should choose another tool (Pinnacle's own Studio DC10plus, for example).

Installing the parallel port encoder is generally a simple task, though it may involve a trip to the system BIOS to change your parallel port to ECP mode. All capturing and editing by this product is done in MPEG-1 format, so you don't need a capture card in addition to the encoder. Pinnacle's editor, Studio, is a well-organized, full-screen program with three tabs—Capture, Edit, and Make Movie—that direct work flow; no project templates are included, however.

You capture in MPEG-1 format using a small preview window to adjust the color and brightness of the incoming video. Studio automatically scans the capture file for scene changes and creates separate files for each scene, a great feature when capturing long, multi-scene videos but a hindrance for capturing short, targeted segments, as we did on our tests.

The Studio Editor can either be a storyboard or a timeline, both with tracks for video, titles, voiceover, and background music. Simple controls found in Studio's toolbox include a frame-accurate trimming window, a narration recorder, tools for ripping music tracks from CD-ROMs, and SmartSound, technology licensed from Sonic Desktop for creating custom background tracks. Studio also provides a mixer to adjust the volumes of the different tracks, but audio fade tools are primitive.

Studio offers 100 primarily two-dimensional transitions, which dither diagonal edges to create a ragged but artistic look. Studio's feature-rich titling tool, TitleDeko, has a library of looks combining text face, edge, shadow, and background characteristics. You can also create rectangular and elliptical backgrounds,

and precisely place title text with kerning, skewing, and rotation tools. You can fade titles in and out, and you can overlay graphics on the video, although we found the function awkwardly implemented and poorly documented.

Timeline operation is very efficient, with all effects rendered near real time. This enables almost instant, full-movie preview. When you're ready to render, you can output in AVI format or in MPEG-1 format for digital distribution or writing back to tape, but Studio doesn't output in either Real or ASF formats.

MPEG-1 output options are simple, but Studio supports only 352-by-240 output, which is slightly wider than the correct 320-by-240 resolution. MPEG-1 audio/video quality was quite good. That said, visual artifacts become apparent when writing video back out to tape, so tape-based producers should choose either an M-JPEG or DV-based solution. Producing AVI files is complicated, and though compressed video output quality was high, Studio produced obvious slurring when down-sampling audio from CD-ROM quality to 11-kHz, 16-bit mono.

Though not without faults, Studio is a sophisticated tool that's simple enough for beginners, but best suited for MPEG-1 publishers.

Ulead VideoStudio

Ulead VideoStudio 3.0 (\$100 street) is an appealing but frustrating product that tries too hard in some areas but not hard enough in others. The result is a poor candidate for retail purchase, but with minor interface advances, the product could be great when bundled with a capture card.

Although VideoStudio includes a wizard, it provides little value. We recommend starting with the main program, which logically moves you through the project with sequential menu items that spawn context-sensitive controls. The program resembles a boom box, with library, preview, and control windows sitting over a construction area configurable as either a timeline or storyboard.

The program offers a good range of editing functionality, and it handled all project requirements except logo overlay. Ulead offers over 100 transitions, including page curls and other 3-D effects, with rendering

file to speed final-project rendering. VideoStudio also uses temporary files to transfer projects back to tape from the timeline, avoiding Windows' 2GB AVI-file limitation and enabling projects longer than 10 minutes.

Unfortunately, this feature works best with board-specific drivers that weren't available for any of our capture cards, and performance was erratic on our tests. This makes VideoStudio a poor choice for current capture-card owners seeking a new editor, but the feature should work well when VideoStudio is bundled with a capture card.

Of the reviewed products, VideoStudio supports the broadest range of output options, including AVI, MPEG-1, ASF, RealMedia, and QuickTime formats. But there are no wizards to guide novices through these controls: They'll see the same confusing options available to professionals in programs such as Adobe Premiere. Compression performance was generally good, especially for RealMedia and MPEG-1 output, though the audio on

our Indeo test clip exhibited slight slurring from the down-sampling from CD-ROM to 11-kHz, 16-bit mono.

We found some encoding bright spots, however. For example, if you need to make changes to a rendered project, VideoStudio renders only the changed regions, not the entire file, which speeds re-rendering time dramatically.

Though this is Version 3.0, VideoStudio has a distinct 1.0 feel, with an interface and feature set that needs paring and focus. But it is an ambitious product with undeniable appeal, primarily within the context of a bundle with a capture card.



quality superior to that of Cinema and Studio MP10 and similar to that of Video-

WaveII. You create titles directly over the video image, which is helpful, and select text motion and fade effects with buttons. On the audio front, you can record narration tracks, grab files from CD-ROM, and fade all audio files in and out.

During preview, VideoStudio's Smart Render feature saves the rendered segment to a temporary file, allowing real-time playback the second time around; the program uses the

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so we have to
be the best.

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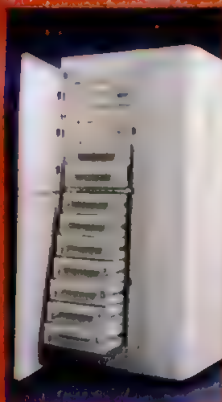
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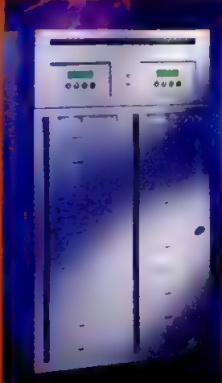
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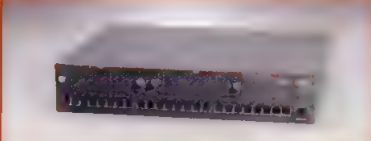
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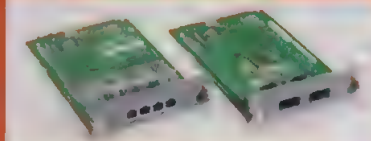
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iGrafx: All Business, All the Time

Micrografx's iGrafx Business suite combines a vector drawing program with image editing and 3-D modeling and animation.

By Luisa Simone

As part of the iGrafx family of products, the iGrafx Business suite (\$200 list), from Micrografx, is targeted at general users within a corporation—anyone who creates presentations, draws simple diagrams, or contributes to the company Web site. This first offering in the iGrafx line consists of a vector drawing program (Business Graphics), an image editing program (Business Image), and a 3-D modeling and animation product (Business 3D).

Micrografx has stressed ease of use, with a retooled, common interface that has Microsoft Office-style toolbars, wizards, and a Visual Toolbar. If you select an object in Business Graphics, the Visual Toolbar immediately displays the appropriate editing tools.

In our opinion, the Visual Toolbar works best in Business 3D, where clicking on an option in the toolbar always invokes a wizard. In Business Graphics and Image, the Visual Toolbar

helps novices find the right tool, but it ultimately requires them to grapple with the same old difficulties such as editing the nodes on a vector curve.

On the upside, these products provide great functionality. The data-driven charting in Business Graphics, for example, lets you modify a flow chart or org chart by entering new data—no drawing necessary. And the suite provides a very broad range of functionality, so you can create animated GIFs in Business 3D or color-correct a scanned

INTERACTIVE When you select an object in iGrafx Business Graphics, the Visual Toolbar (left) immediately displays the appropriate editing functions.

picture using Business Image. We feel, however, that iGrafx's approach (which requires users to work with three different programs) ultimately doesn't deliver the convenience found in newer products that seamlessly combine raster and vector data, such as Macromedia Fireworks or Microsoft PhotoDraw.

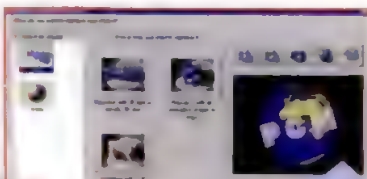
The success of iGrafx Business rests upon its ability to function within a large corporation. Toward that end, Micrografx has included three essential utilities: iGrafx Deploy, iGrafx Share Media, and iGrafx Share Viewer. Though we found the Install Shield to be particular about nitty-gritty network issues (such as legal directory names), we

successfully installed the software to a workstation from the PC Labs server.

Share Media functions as an image-management tool. It supports both private and public collections. The latter allows users within a corporation to share commonly used images such as company logos easily.

Share Viewer lets users read and annotate an iGrafx file in its native format, even if they don't use the specific iGrafx program that authored the image. Unfortunately, Share Viewer can only add comments to vector drawing files and not the files produced by Business Image or Business 3D.

After working with iGrafx



SCENIC

The 3-D program within the iGrafx Business suite greatly simplifies the 3-D creation process.

Business, we feel that the core graphics applications need further refinement.

But the secondary utilities, specifically Deploy and Share (and the interoperability they promise with the other high-end iGrafx programs) may prove compelling to corporate customers.

iGrafx Business. List Price: \$200. Requires: 95MB hard disk space; 16MB RAM for Windows 95 or 98, 32MB RAM for NT 4.0. Micrografx Inc., Richardson, TX; 972-234-1769; www.micrografx.com.

The iGrafx Strategy

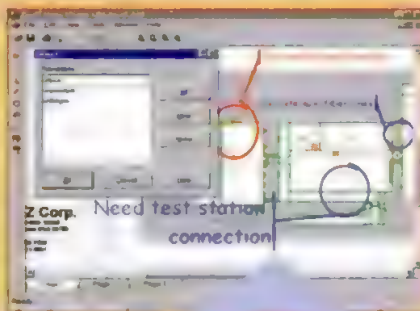
Micrografx has rededicated itself to the corporate graphics market by retooling its varied program offerings into a cohesive product line. The iGrafx product family addresses the needs of three distinct user groups within the corporation: general users, professionals, and specialists.

The Business suite (\$200 list) reviewed here is intended for general users (think: middle managers) who need easy-to-use graphics software. Professional users, found in areas such as an art department, need a higher level of functionality. For them, the iGrafx Designer (\$400) and iGrafx Pro (\$400) provide technical illustration and structured diagramming tools, respectively.

Finally, a trio of high-end charting programs—the Enterprise Charter (\$349 list), iGrafx Process (\$995), and iGrafx Network Charter Pro (\$995)—address the needs of specialists, including

network engineers and IT professionals. These tools are used to visualize business-critical information, such as compliance to the SAP R/3 reference model and automatically generated network configuration diagrams. For custom graphics-driven applications, there's iGrafx Development (\$995), a SDK that supports Visual Basic.

All products in the iGrafx line bundle iGrafx Share (also available as a \$100 standalone product), which lets users share, view, and



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Liven up Web Ads

Headline Studio 1.0 lets you fine-tune Web animations, but this first release has some rough spots.

By Luisa Simone

MetaCreations sees the burgeoning world of Web-based advertising as a niche graphics market. By way of proof, the company has released Headline Studio 1.0 (\$200 street), dedicated to the production of animated GIF banner ads. Though you can create impressive effects, the large file sizes they require are a detriment.

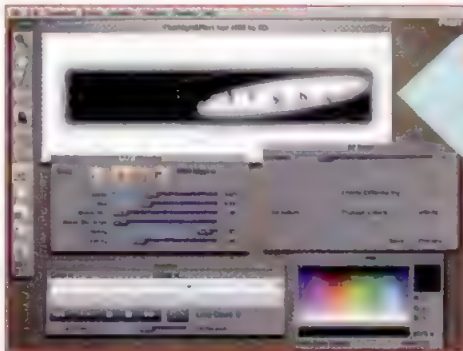
The program distinguishes itself from other frame-based, GIF animation programs by using a true timeline and key-points to structure animations. The actual frame count is determined at output time, when the internally created text and vector objects (and imported bitmapped images) are rendered. This feature lets designers fine-tune an animation easily. It also lets them output the same source file at different frame rates.

There are several features that make Headline Studio more powerful than other GIF animation programs. Its motion-blur filter and interpolation methods (such as Ease In and Tight Spring) produce truly realistic movement. And sophisticated compositing options let objects interact in visually complex ways. For example, you can create the effect of a spotlight illuminating a message against an otherwise dark background by applying the program's XOR Mask to an animated circle.

There are lots of things to like about Headline Studio. You can specify exact values for every animatable property in the program. The program supports Web-safe and custom palettes. For extra pizzazz, you can use the Split command, which lets you apply an animation effect sequentially to individual letters in a text string.

As a 1.0 release, however, Headline Studio has some shortcomings. It can't output transparent GIFs. The overly simpli-

fied timeline displays keypoints for only one object and one effect at a time, so synchronizing multiple events is difficult. And though the product claims to be a total solution to Web banner creation, it cannot create any HTML code to add hotspots and destination URLs to an animation.



ILLUMINATE: Headline Studio 1.0's flashlight effect (shown here) applies the XOR Mask to an animated circle.

Finally, the very technology that makes Headline Studio so powerful is also at the root of the pro-

gram's biggest problem. It is difficult to achieve the small file sizes required by many Web portals (12K is typical) and still maintain the motion blurs, opacity changes, and smooth motion of which Headline Studio is capable.

In a world where bandwidth is increasing every day, though, Headline Studio stands ready

to deliver compelling, high-fidelity GIF animations.

MetaCreations Headline Studio 1.0.

Street price: \$200 (download, \$170). Requires: 32MB RAM; 5MB hard disk space; Windows 95, 98, or NT 4.0 (with Service Pack 3). MetaCreations Corp., Carpinteria, CA; 805-566-6200; www.metacreations.com.

Postage in Your PC

Neopost's Simply Postage, the first PC-based postage system to hit the retail market, is a winner.

By Kathy Yakal

Though it's early in the race for downloadable postage, the first horse out of the gate looks very promising. Neopost, a French company, received U.S. Postal Service approval for Simply Postage, a hardware/software combo that downloads postage from the Internet and prints metered postage labels.

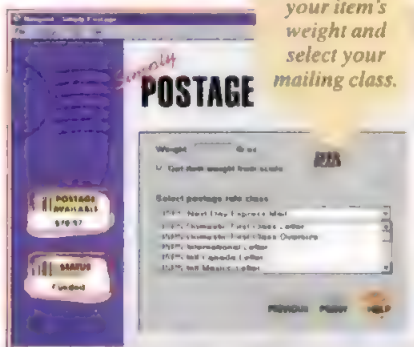
Setup was uncomplicated and fast; we needed less than 30 minutes to hook up the hardware, install the software, download postage, and print the first "stamp." The system requires desktop space for two small peripherals: a postage scale and a postage meter/thermal printing device. A cable connects these two, and the printer connects to your PC's serial cable (a USB version is in the works).

You can download Simply Postage software (\$49.99 list) from the company's Web site (www.simplypostage.com); it's expected to be available at retail later this year. Once you've purchased the software, you'll re-

ceive the hardware through the mail within a few days.

Your first \$50 worth of postage is free, as is your first month's membership fee (\$17.95 per month thereafter). You can download a maximum of \$500 worth of postage at a time. The first download each month is free; each additional download costs \$.50. Additional blank stamp rolls cost

POSTMODERN
To print a metered, self-adhesive stamp with Simply Postage, enter your item's weight and select your mailing class.



\$6.99 for 100 and \$9.99 for 200.

The system's software is ATM-simple. The opening screen displays how much postage is available and provides large icons for accessing program features. You

can print a 33-cent stamp, specifying the destination ZIP code, and enter the mailing date. The meter/printer pops out a self-adhesive "stamp" that you affix to items. Another option lets you either manually enter a weight or let the software automatically read the weight from the scale; you then select the mailing class. A final option lets you disconnect the meter/printer from your PC and set it up elsewhere.

Simply Postage's nearest competitor at this point is the Pitney-Bowes Personal Post Office, which is bigger and more expensive. Simply Postage's low cost, convenience, and simplicity can save you time and—as a result—money.

Simply Postage. List price: membership fee (includes hardware, software, and \$50 postage), \$49.99;

\$17.95 per month after the first month. Requires: 16MB RAM; 2MB hard disk space; Microsoft Windows 95, 98, or NT. Neopost, Hayward, CA; 877-397-8267; www.simplypostage.com.

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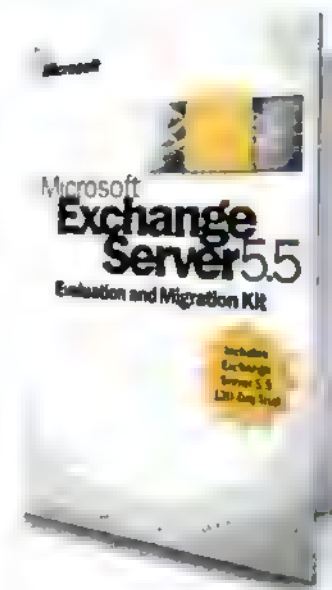
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Microsoft

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Windows CE Hand-Helds for the Masses

The Cassiopeia E-15 and Nino 200 monochrome P/PCs are packed with features, but priced lower than their color-screen brethren.

By Bruce and Marge Brown

Do you want lower-cost alternatives to \$500 color Windows CE palm-size PCs, with longer battery life to boot? If the answer is yes, you should check out two new P/PCs from Casio and Philips Electronics. The Casio Cassiopeia E-15 (\$400 street) and the Philips Nino 200 (\$300 street) are both monochrome devices with infrared beaming, audio recording and playback, and handwriting recognition for notes, among other capabilities.

VIEWABLE: The E-15's screen is large and bright.

CASIO CASSIOPEIA E-15

For \$100 more than the Nino 200, the Casio Cassiopeia E-15 includes metal hydride rechargeable batteries, plus twice the internal memory of the Nino, with 16MB each of ROM and RAM. The E-15 is intended for professional users who want extra memory for application and file storage, as well as a lower price and longer battery life than color-screen models.

The E-15 runs on a 69-MHz NEC VR4111 processor; we found in testing that response time was good. Casio rates the unit's battery life at 25 hours using two triple-A alkaline batteries or 20 hours using the standard rechargeable battery pack. (These figures are based on 10 minutes of viewing and 1 minute of entry per session.)

For a screen, the E-15 uses a brightly backlit, 240-by-320 passive-matrix LCD. This 4-inch-diagonal panel is 3.5 inches high by 2.4 inches wide, and features 16 levels of gray-scale adjustment. The E-15's screen is slightly larger and significantly brighter than the Nino 200's; surprisingly, the Casio unit is smaller and lighter, measuring

just 5 by 3.3 by 0.6 inches (HWD) and weighing 6.6 ounces with batteries.

The E-15's control buttons are on the front and on the left side of its silver case. A large scroll button and three smaller buttons to launch applications are located just below the screen area.

All other controls are on the left panel, including a power button, scroll dial, exit button, and a fourth application button that's programmable.

Preloaded Windows CE applications (resident in ROM) are identical to those on the Nino 200; they include ActiveSync, Calculator, Channel Browser, Note Taker, Pocket Outlook, Solitaire, Voice Recorder, and Communication Intelligence Corp.'s JOT handwriting recognition application. Casio also adds a gray-scale adjustment utility, a CompactFlash back-up program, and an application launcher.

You'll also get quite a few applications on CD-ROM. They include Audible's AudiblePlayer for MP3 files, AvantGo's AvantGo Client 2.0 Web browser, Casio's Schedule Viewer and Pocket Data Base, Extended Systems' Enterprise Harmony

'99, and LandWare's Financial Consultant Calculator.

Like the Nino 200, the E-15 has a serial port with a proprietary connector for communicating with the desktop, a 115-Kbps infrared port, as well as three types of alarms (pop-up screen messages, audio alerts, and flashing LEDs). The Casio system also features a monaural headphone jack, an integrated microphone, and an integrated speaker.

The extra \$100 that you'll spend for the E-15 (compared

USABLE: The Nino 200 is designed for one-handed use.

es (HWD) and weighing 8 ounces with batteries. The Nino 200 runs on two double-A alkaline or nickel hydride batteries, and it's rated for 10 to 12 hours of continuous use with either battery type.

Standard Windows CE 2.11 applications are stored in the Nino's 8MB of ROM; they're identical to those of the Casio system. The device's 8MB of RAM is expandable to 48MB with third-party CompactFlash cards, which are securely stored in a CompactFlash card slot with a sturdy cover.

The Nino 200 delivers good response time from its 75-MHz, 32-bit MIPS processor. The 3.8-inch diagonal, 3 by 2.3 inch (HW) backlit screen is adjustable, with a contrast dial located on the side panel. Text and graphics are displayed at 320-by-240 resolution in four shades of gray. The Nino 200's screen is adequate but nowhere near as bright as the Casio's.

The control buttons on the Nino 200 are large for a P/PC, simple to operate one-handed, and intuitively designed. There are four Quick Start keys on the right side of the unit for launching favorite applications; a combined scroll/action button as well as an application exit button are on the left. A speaker and microphone are integrated for recording and listening to audio files.

The Nino 200 is a serviceable machine for novice users, its intended audience. But for just \$50 more, opt for the Nino 300, which includes a docking station, rechargeable batteries, and voice command-and-control software. **Philips Nino 200.** Street price: \$300. Requires: 10MB hard disk space, Windows 95 or 98 (12MB RAM recommended) or NT 4.0 (32MB RAM recommended), Windows CE Services 2.2. Philips Electronics, Campbell, CA; 888-275-8356; <http://nino.philips.com>.

with the Nino 200) is money well spent: You get a brighter screen, rechargeable batteries, twice the standard memory, and lots more applications.

Casio Cassiopeia E-15. Street price: \$400. Requires: 10MB hard disk space, Windows 95 or 98 (12MB RAM recommended) or NT 4.0 (32MB RAM recommended), Windows CE Services 2.2. Casio Inc., Dover, NJ; 888-204-7765; www.casio.com.

PHILIPS NINO 200

The value-oriented Philips Nino 200 is designed for first-time P/PC users. The unit's metallic blue case is slightly larger and heavier than that of the E-15, measuring 5.4 by 3.3 by 0.8 inch-





(PC Sold Separately)

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Midrange Megapixel Magic

New Epson, Eastman Kodak, and Toshiba digital cameras deliver performance—for \$600 to \$800.

By Marge and Bruce Brown

With low-end megapixel cameras now selling for less than \$500 and 2-megapixel cameras available for \$1,000, the sweet spot for many buyers may be in the \$600-to-\$800 range. Here, you can buy a well-equipped megapixel camera that prints images up to 8 by 10 inches without paying a stratospheric price.

New midrange megapixel cameras include the sturdy 1.3-megapixel Eastman Kodak DC240 Zoom Digital Camera (\$700 street), complete with a value-packed accessory kit; the 1.25-megapixel Epson PhotoPC 750Z (\$800 street), with HyPict image enhancement to 1.92 megapixels and a LCD Solar Assist Panel; and the 1.5-megapixel Toshiba PDR-M3 Digital Still Camera (\$600 street). All three cameras boast 3X optical and 2X digital zoom, interchangeable batteries with standard chargers, video output for presentations on televisions or projectors, and removable storage media.

STURDY MEGAPIXEL

Designed for business applications but also a great choice for personal use, the Eastman Kodak DC240 Zoom Digital Camera is easy to hold and use and supports serial and USB image transfer. The DC240 also takes great pictures with good color and detail. The camera weighs 15.4 ounces with battery and measures 2.9 by 5.1 by 1.6-inches (HWD).

The DC240 comes with an 8MB CompactFlash card; cables for serial, USB, and audio/video connections; four double-A alkaline batteries (so you can get started immediately); and four double-A nickel hydride batteries with a charger (charging takes 8 hours). The introductory accessory kit (included for now, with no set expiration date) includes four additional nickel hydride batteries, a second 8MB CF card, a parallel port CF card reader, and a PC Card CF adapter—all easily worth more than \$150. An AC adapter (\$40 street) is not included.

The camera's 1.8-inch color LCD has a magnifying feature and continuous brightness control. Menus use vividly colored icons and a large font for easy navigation. Power-up time was 4 seconds in testing.

Image settings include two resolutions (1,280-by-960 and 640-by-480) and automatic and manual adjustments for exposure, flash, and white balance. Three quality settings include

Best (three shots per 1MB of storage), Better (four shots per 1MB), and Good (seven shots per 1MB). One control handles both the 3X optical and 2X digital zoom, and there are special modes for shooting landscapes and black-and-white, sepia, and document images.

Manual exposure settings in the DC240 allow adjustments



from +2.0 to -2.0 in increments of 0.5, with even-weighted and center-weighted exposure balances. Kodak supplies borders in the DC240 that you can add as permanent attachments to your images. You can also create your own BMP file borders, using, for example, a logo or signature.

Five bundled applications are an image-transfer utility, a Twain-compliant viewer, a program to control camera settings from your computer, Picture Easy for managing up-

loaded images, and a utility for creating camera-based image borders.

Eastman Kodak DC240 Zoom Digital Camera. Street price: \$700. Requires: 16MB RAM; 70MB hard disk space; Windows 95, 98, or NT 4.0 or later. Eastman Kodak Co., Rochester, NY; 800-235-6325; www.kodak.com.

RESOLUTION STRETCH

The innovative Epson PhotoPC 750Z is a good choice for business users and general consumers. Its foremost feature, Epson's HyPict image enhancer, upgrades 1,280-by-960-resolution, 1.25-megapixel images to 1,600-by-1,200 resolution. Other standout features include the LCD Solar Assist

Panel, 4-second power up, and 12MB of standard image storage—4MB internal and 8MB external.

The 750Z weighs 15 ounces with batteries and measures 3 by 5.3 by 2.3 inches (HWD). A soft case, strap, a lens cap, four double-A nickel hydride batteries and charger, serial and video cables, and Direct Print cables to connect it to many Epson printers are all included. An AC adapter is optional (\$50 street).

HyPict is the highest of the 750Z's four resolution modes. Within the camera, 1.92-megapixel images are interpolated from 1.25-megapixel optical images before JPEG file compression to produce 8- by 10-inch prints at 1,600-by-1,200 resolution or 1,600-by-600 panoramic shots. In testing, HyPict mode required a 14-second delay between shots, but the printed images were clear and bright.

The LCD Solar Assist Panel uses direct sunlight to illuminate the 2-inch LCD and extend battery life, which is enabled with a small switch next to the LCD. The solar panel works reasonably well but only out of doors. The camera's focus (4 inches to infinity), flash, shutter, white balance, and exposure have automatic settings, with manual adjustments for flash, white balance, exposure, and black-and-white shots.

Quick Shot mode stores images in DRAM for taking high-resolution shots (not HyPict) 3 seconds apart, but in testing, there was no significant timing



difference between Quick Shot and the default setting. In Continuous Shoot mode, the camera automatically captures up to 16 motion shots in 8 seconds—a feature that is quick to set up and that produced sharp test images. Other picture modes include macro, 2X digital zoom, and panorama.

The Epson PhotoPC 750Z's software bundle includes Sierra Imaging's Image Expert, a Twain driver, a file-transfer utility, and a direct-printing driver. **Epson PhotoPC 750Z.** Street price: \$800. Requires: 16MB RAM; 40MB hard disk space; Windows 95, 98, NT 3.51 (with Service Pack 3), or NT 4.0. Epson America Inc., Torrance, CA; 800-463-7766; www.epson.com.

BATTERY BOOST

The Toshiba PDR-M3 Digital Still Camera, which replaces the PDR-M1, is upgraded with

3X optical zoom and 2X digital zoom, plus 4X playback zoom for image viewing, and a rechargeable lithium ion battery. With a slightly larger case than the previous model, the PDR-M3 retains its predecessor's 0.5-inch charge-coupled device, 1.5 megapixel, 1280-by-1024-maximum resolution, 1.8-inch color LCD, and 3.3-volt SmartMedia storage (a 4MB card is included). At the

same price as the PDR-M1 unit, the PDR-M3 is a serious market contender for business and personal use.

The 14.8-ounce PDR-M3 (with battery) measures 3.5 by 4.8 by 2.3 inches (HWD). The lithium ion battery takes 7 hours to charge and is rated for 230 consecutive frames with the LCD off. An optional battery charger (\$70 street) is available for faster recharging (2.5 hours). The PDR-M3 package also includes an AC adapter, carrying strap, lens cover, and video and serial cables.

The PDR-M3's Mode Dial has clear icons for camera settings. Automatic mode with one of three quality settings is simplest to operate. In manual mode, you select from six white-balance settings, four flash modes, two aperture adjustments, and nine exposure levels.

There are three adjustments for image sharpness and one for color or black-and-white, the latter useful for recording documents. Two playback filters—soft and cross-filter—are available.

The PDR-M3 takes 10 seconds to power up—time that can result in lost shots. And the sound of the mechanical operations of this camera is distracting; but captured images are bright and detailed.

You upload images from the PDR-M3 via a serial cable or an optional FlashPath 3.5-inch floppy disk adapter (\$100 street). The software bundle includes Sierra Imaging's Image Expert for image editing and presentations and the Camio Viewer image-file manager.

Toshiba PDR-M3 Digital Still Camera. Street price: \$600. Requires: 16MB RAM, 16MB hard disk space, Windows 95 or 98. Toshiba America Information Systems Inc., Irvine, CA; 800-228-1354; www.toshiba.com.

Put Your Photo Album Online

Now you can invite anyone to view your digital images, complete with multimedia annotation. Club Photo's Living Album 99, a free download, is photo album software with which you can store and publish digital images for no charge on the Club Photo Web site (www.clubphoto.com), with the cost of service supported by banner ads. Living Album 99 Pro (\$40 direct) lets you add color text and attach audio and video clips to your images, as well as send multimedia e-mail; it includes an upgraded one-year club membership for album pages without banner ads.

There are five Living Album 99 Pro album templates, with designs more suitable for personal than business use, but more are planned. Each album page holds 36 images, and you can add unlimited pages per album. A wizard guides you through image-file location and album organization. In all, 28 standard image-file formats are supported, including BMP, FPX, GIF, JPEG, PCX, and TIFF.

You can quickly move images across albums and within an album by dragging and dropping thumbnails. From the

album screen, you access photo-editor and slide-show features, including transition effects (from a choice of 50 types). You can also add color text descriptions, audio (WAV) files, and video (AVI) files and send albums via e-mail.

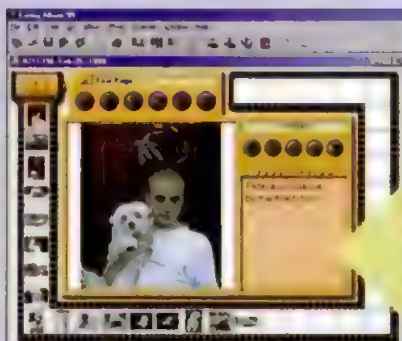
Club Photo members can upload an unlimited number of albums, album pages, and revisions to the Club Photo Web

site for viewing, with or without password protection. Images uploaded by Living Album 99 Pro software owners are stored indefinitely and have no attached banner ads; users of the basic version have banner ads on their album pages, can't store audio and video files with images, and are not promised indefinite image storage.

Living Album 99 Pro is a well-structured guide to

creating multimedia albums and slide shows, even if you don't use Club Photo for storing your images. The program also includes an archiving step to back up albums on your hard disk or external storage device—a smart recommendation.—BB

Living Album 99 Pro. Direct price: \$40. Requires: 32MB RAM; 8MB hard disk space; Windows 95, 98, NT 4.0 or later. Club Photo Inc., San Jose, CA; 408-557-6845; www.clubphoto.com.



PICTURE THIS: You can place up to 36 images on an album page within Living Album 99 Pro.



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An All-Purpose Web Page Editor

IBM NetObjects TopPage is an equally appropriate tool for both beginners and professional Web developers.

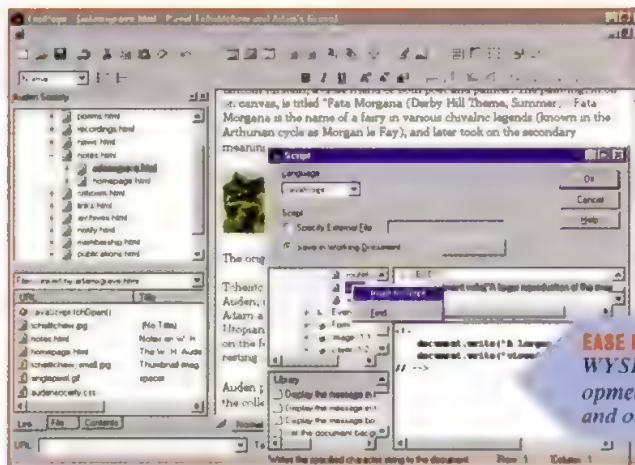
By Edward Mendelson

IBM Corp. accurately describes its new NetObjects TopPage (\$60 street) as an all-in-one tool that small businesses, individuals, and schools can use to build good-looking Web sites easily. But TopPage is also an advanced development environment in which Webmasters can apply Dynamic HTML effects to links or graphics, edit Cascading Style Sheets, build editable site maps, crop or rotate images, build JavaScript, and create and manage frames. TopPage creates Web pages that work equally well in all browsers and surpasses Microsoft FrontPage in clarity and ease of use.

The program's interface resembles other advanced Web editors. Below a set of toolbars and menus are a site management pane and an editing pane that can display one or more pages. Tabs in the editing window switch between WYSIWYG editing mode, an HTML code editor, and a preview window that uses Internet Explorer.

The WYSIWYG editor displays an outline around the current HTML element as you work. A pop-up dialog lists actions you can apply to elements, such as changing formatting without directly editing code or applying JavaScript behaviors such as mouse-overs simply by selecting them from a list.

The site management pane also uses tabs to switch among three modes. The Link tab displays a list of files in a Web site and a list of links to or from the currently selected file. The File tab displays a tree-style list of subdirectories and files in the current folder. The Contents tab displays resources in the current folder and in TopPage's folders of samples, together with thumbnails of graphics and files



EASE FOR ALL: TopPage combines WYSIWYG page editing with a development environment for JavaScript and other advanced features.

that can be dragged directly into the editing window.

An optional pop-up window displays a stylesheet editor but

surprisingly lacks a real-time preview. Another window displays a Web-safe color palette, and additional windows let you

modify the tag structure of a file or insert JavaScript code from a tree-structured list.

A few minor annoyances afflict this otherwise elegant package. Some interface elements can't be navigated from the keyboard, and existing HTML code is slightly reformatted when imported. In general, however, TopPage jumps to the top of the list of Web page editors equally suitable for beginners and experts.

IBM NetObjects TopPage. Street price: \$60. Requires: 16MB

RAM, 30MB hard disk space, Windows 95 or later. IBM Corp., Redmond WA; 800-320-8377; www.pc.ibm.com/us/software.

Sony's 200MB Floppy Disk Drive

The Sony HiFD floppy disk drive is a great concept, but the first-to-market external parallel-port version lacks both speed and utility.

By Alfred Poor

More than a year after Sony Electronics first announced the Sony HiFD (\$199 list), the floppy disk drive is finally shipping in quantity. But although the 200MB capacity is certainly a welcome improvement over the familiar 1.44MB floppy disk, the initial configuration of this drive leaves something to be desired.

One of the HiFD's strong points is its backward compatibility with existing floppy disk media. The read/write head can read and write old disks as well as the new, higher-density HiFD media (\$15 list apiece, \$40 for a three-pack).

The HiFD drive mechanism is rated for transfer rates of up to 3.6 MBps using an

IDE interface, but you won't get close to that with this drive: The initial offering connects to your PC externally via parallel port. Although the HiFD is easy to install and configure, the bandwidth of the connection is severely limited. According to the drive's specifications, it is rated for a maximum data-transfer rate of just 600K per second.

On our tests, we copied two files containing 167,776K from a hard disk to the HiFD drive under Windows 98 using

Windows Explorer; the drive took 7 minutes 14 seconds to complete the transfer. That's just 386K per second—faster than a floppy disk drive but slow compared with other high-capacity removable-media drives.

Under Windows 95 and 98, the drive uses Shuttle Connect-IT software from Shuttle Technology, which lets you connect and disconnect devices without having to reboot. It also provides some diagnostic and configuration options that make the drive easier to use.

One aspect of the Sony HiFD that lessens its ease of use is that it has no power switch. The manual specifies not leave the power on when the drive is not in use, so you have to unplug the power cord when you shut down.

Sony plans to deliver USB, PC Card, and internal-upgrade versions of this drive, as well as models for use in notebooks. The HiFD will make much more sense when it can take the place of a floppy disk drive—not exist as an adjunct to it.

Sony HiFD. List price: \$199. Sony Electronics, San Jose, CA; 800-352-7669; www.sony.com/storagebysony.



DEJA VU: A HiFD disk comes in a hard case similar to that of a 3.5-inch floppy disk.



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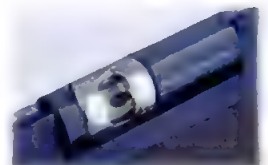
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SONY

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Small Business Servers Made Easy

The elegantly simple Compaq Prosignia NeoServer Internet Plus delivers essential hardware and services for small business networks.

By Bruce Brown

Maybe your small or medium-size business isn't yet on a network. Or perhaps you're using peer-to-peer networking for file and peripheral sharing, but you want to step up to greater network functionality—such as automatic backups, remote access, and shared Internet access—without having to know about network administration. Targeted at businesses with up to 25 PCs, the Compaq Prosignia NeoServer Internet Plus (\$1,700 street) is a sealed-box server that comes with most of what you'll need to get your network running in a surprisingly short time.

Two NeoServer versions are available: the Internet Plus model with 56K-modem shared-Internet-access capability (which we tested) and a lower-priced version (\$1,400 street) without Internet access. Each is powered by a 366-MHz Celeron CPU and equipped with 32MB of RAM (nonexpandable), a 6GB internal hard disk, and an 8GB removable backup drive.

Also included are an eight-port, 10-Mbps Ethernet hub with an uplink port and a 6-foot Category 5 cable to connect the hub with the server. If you later decide to upgrade to 100-Mbps Fast Ethernet, the NIC installed in the server auto-switches between 10 Mbps and 100 Mbps, so all you'll need to add is a Fast Ethernet hub.

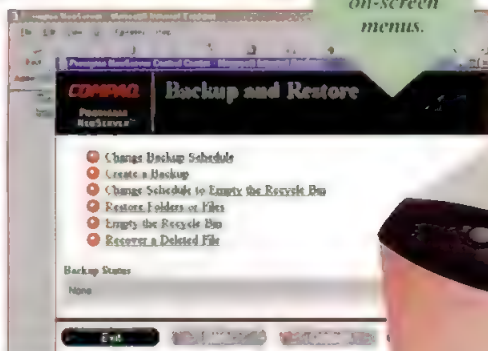
FLEXIBLE NETWORKING

The NeoServer runs a version of SCO Open Server and can support a mix of clients running Windows for Workgroups 3.11, 95, 98, and NT 4.0, and MacOS 7.6 and higher. Software running on the server maintains system, client, user, and security

information and controls network file sharing, peripheral sharing, remote access, automatic data backup, and—on the Internet Plus model—e-mail, simultaneous Internet access, and remote access. A firewall is also included.

The NeoServer is housed in a mini-tower case that measures 15 by 7.8 by 13 inches (HWD). A door on the front of the case opens to reveal two locking,

SIMPLE: You're aided in making changes to the Compaq Prosignia NeoServer Backup and Restore menu by clear on-screen menus.



removable drive bays, each with a fold-out handle for easy access. One bay holds the standard 8GB backup drive; the second is available for an additional backup drive.

There is an on/off switch on the back of the case, but a main power button is located up front. Below the main power button are four icons that, when lit, indicate power on, network operating system ready, hard disk activity, and Internet activity.

No monitor, keyboard, or mouse is included, and there are no ports to connect those devices to the server: The NeoServer is a closed box intended to run all the time, and it comes ready to run. To begin configuring your own network, you start with a client PC with a network card installed, attach it to the NeoServer's hub, and run the NeoServer setup program.

Server-based network setup

and administration have traditionally required specialized knowledge and experience. The greatest value of the NeoServer is that Compaq has provided a network-server-hardware base, operating system, and applications—as well as supporting materials and software—that let you get the NeoServer set up and the network running.

Though you get a two-sided setup poster and a CD-ROM tutorial, the manual alone is

Our initial run of the automated setup program was not successful, because the program did not detect that the attached client had been configured to use proxy software on another network. The troubleshooting section of the excellent user manual saved the day: It provided an easy-to-follow manual configuration process that corrected the errant settings within minutes. If setup had been performed with a PC that had never been used on a network, the total installation time would have been less than 10 minutes. As it was, the whole process took only about half an hour.

CONFIGURE YOUR NETWORK

Once you've run the NeoServer setup program, you can add users, set passwords, configure user Internet-access rights, and change backup schedules. Administration features are controlled by the NeoServer Control Center Menu, which runs in browser style with either Internet Explorer or Netscape Navigator. You can also view the network system status via the Control Center to monitor server drive information, Internet status, logged users, backup status, and server settings.

With a timely investment in a network server and careful planning, businesses



SELF-CONTAINED: The NeoServer is a closed box that comes ready to run.

sufficient to help you set up and troubleshoot the network configuration as well as administer a NeoServer-based network. The materials stress planning such matters as which PCs and peripherals will be attached to the network, which is licensed to manage up to 25 with the use of optional uplinked hubs.

The NeoServer setup program runs on a single PC connected to the network hub. In testing, the NeoServer software detected that the PC used to set up and configure the server and network had previously been used on a peer-to-peer network.

can easily save the money that would be spent on separate printers, modems, and backup solutions. The convenience and security of server-based networking are affordable with the Compaq Prosignia NeoServer, and the high level of integration lets you set up and run a serious network without specially trained staff.

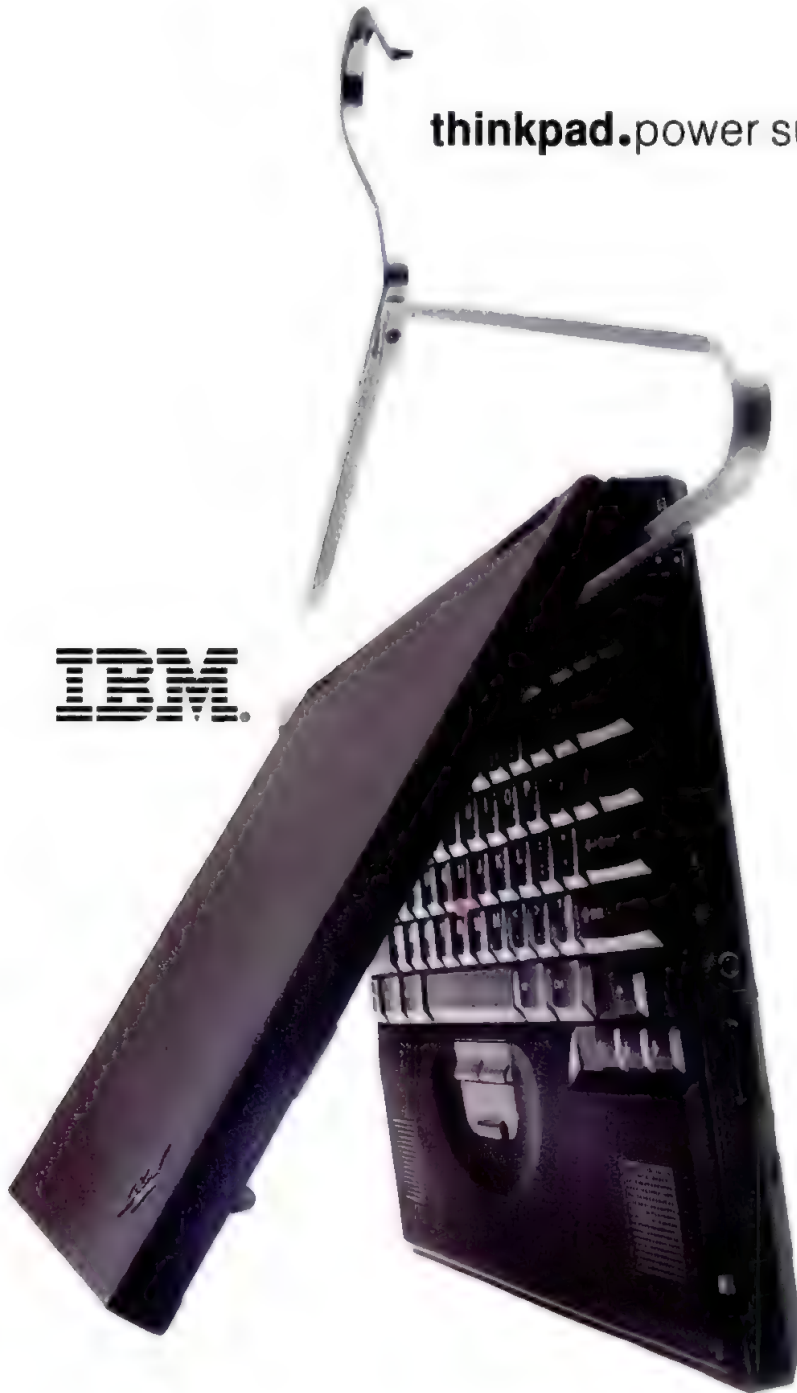
Compaq Prosignia NeoServer Internet Plus. Street price: \$1,700. Requires: Windows 95, 98, or NT 4.0 Workstation. Compaq Computer Corp., Houston; 800-345-1518, 800-888-8177; www.compaq.com.



*Estimated reseller price for models 600/35U-5AU. Actual prices may vary. †Actual weight/thickness may vary due to vendor components, manufacturing process and options. Includes battery (and travel cover on ThinkPad 600 models) and excludes external diskette and dvd drives. ‡Applicable mhz denotes microprocessor internal clock speed only; other factors may also affect application performance. g.b. = 1 billion bytes for HDD capacity. PCs referred to in this ad include an operating system. IBM product names are trademarks of International Business Machines Corporation. Intel, Inside and Pentium are registered trademarks of Intel Corporation. © 1999 IBM Corp. All rights reserved.

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IBM



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processor
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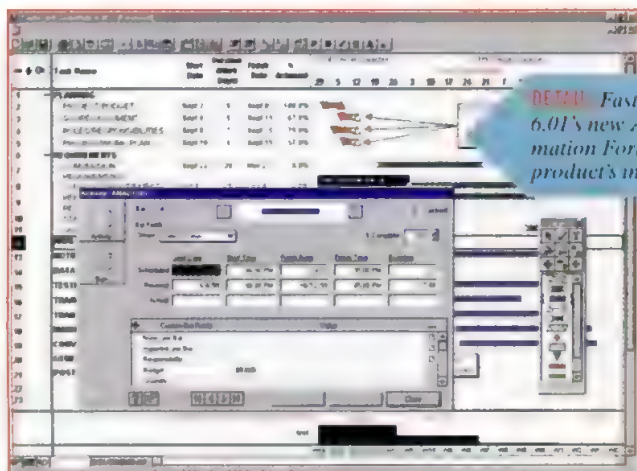
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FastTrack Schedule 6.01's new features—including advanced formatting—improve a fine product.

By Stephen W. Plain

AEC Software maintains its reputation for approachable project management with the new automation and presentation features in FastTrack Schedule 6.01 (\$200 street; Versions 4.x and 5.x users, \$100 upgrade). In the

newest version, you'll find worthwhile refinements.

FastTrack schedules center around collapsible Gantt-style timeline graphs but can now be spruced up with new elements such as correlated histograms, line graphs, headers, and footers. The new histogram feature lets

you display running budgets and other resource distributions along with project schedules.

A new Activity Information Form displays up all of the data associated with the activities in your schedules. By double-clicking on an Activity bar, you have immediate access to all of the standard and custom fields for each activity, as well as hyperlinks and attached notes.

During our testing, we were also impressed with the product's flexible data columns, which appear next to the Gantt chart. We were able to add new custom data quickly, format it just as we liked, and even determine its behavior using the product's new auto-increment and default-value features.

The improvements in this version are not just cosmetic, however. Version 6.01 introduces open and export compatibility with Microsoft Project 3.0 and 4.0 MPX files.

Another new feature, FastSteps Scripting, adds more ability to automate. FastSteps lets you create scripts that perform routine or cumbersome tasks with a single mouse click. Beefed-up filtering and search facilities also boost productivity with added interactivity.

Aside from interactivity, FastTrack's other forte is spectacular output. You can include photographs, callouts, customized legends, and adaptable headers and footers to produce top-notch printouts of your project schedules.

With its attention to the fine details of project management from start to finish, FastTrack Schedule 6.01 is definitely on the right track.

FastTrack Schedule 6.01. Street price: \$200; upgrade from FastTrack 4.0x or 5.0x, \$100; upgrade from FastTrack 3.0 or earlier, \$130. Requires: 4MB RAM, 10MB hard disk space, Windows 95, 98, or NT 4.0. AEC Software Inc., Sterling, VA; 800-346-9413; www.aecsoft.com.

Pro Scanning

The Epson Expression 800 Professional scanner delivers high-quality scans and performance.

By Daniel Grotta and Sally Wiener Grotta

At first glance, the Epson Expression 800 Professional (\$1,000 street) with its attached transparency adapter, looks like a scanner piggybacking on another scanner. But the large size allows for higher quality, less noise, and faster scan speeds. These strengths, along with a fine selection of bundled software—including Adobe Photoshop 5.0 LE and Monaco Profiler Lite—will appeal to businesses and professionals; the 800 Pro may be daunting for novice users, though.

The 800 Pro works equally well with both reflective and transparent materials, so most users won't need a separate film scanner. The 36-bit color scanner

has an optical resolution of 800 ppi and a dynamic range of 3.3 (dynamic range describes the scanner's ability to capture details in highlights and shadows). The 800 Pro's higher resolution and better dynamic range put it in the league of higher-priced units.

We liked a number of the 800 Pro's small but important attributes. For example, its xenon light means instant warm-up, and Monaco Profiler Lite creates a custom closed-loop calibration between the scanner and your printer.

Epson's built-in text enhancement automatically performs an auto-threshold: Anything not black is knocked out of the background, which produces accurate OCR. And the 800 Pro's AAS (Auto Area Segmentation) al-

lows scanning of an original with both text and photo, so the text is automatically optimized for OCR but the photo is dithered.

This produces a gray-scale image that looks better when faxed or uploaded to the Web.

Setup and installation are a bit more difficult than with most inexpensive scanners. There's no software setup wizard, so each driver and program must be installed separately. And attaching the transparency adapter isn't obvious or intuitive.

You can choose between two interfaces: Twain, with its speed, simplicity, and slant toward Web and desktop output or SilverFast 4.0, with the control necessary for professional prepress applications. Using SilverFast's prescan

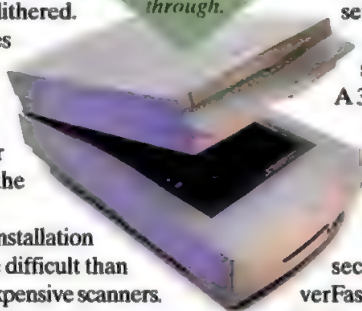
DEFINITION The 800 Pro's transparency adapter prevents bleed-through.

tools (which require a certain level of skill), we were able to get some of the best scans we've seen outside a service bureau.

And the scanner is fast: A 3.28MB photograph scanned at 200 ppi took only 12 seconds via Twain and 17 seconds via SilverFast.

The Epson Expression 800 Professional is great for businesses and professionals who require superior performance and heavy-duty durability.

Epson Expression 800 Professional. Street price: \$1,000. Requires: 16MB RAM, 40MB hard disk space, Windows 95 or later. Epson America Inc., Torrance, CA; 800-463-7766; www.epson.com.



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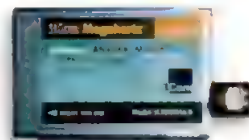
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IN SYNC:
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cludes a voice
recorder/player
that synchro-
nizes with the
portable re-
corder.

Productivity via Voice

Manage audio files, e-mail, and PIM audio data with the Dictaphone Walkabout Quest.

By Marge Brown

Voice recordings become powerful productivity tools with the Dictaphone Walkabout Quest (\$370 street): You can capture audio files for standalone use or as attachments to Personal Information Management (PIM) data and e-mail. The package includes a portable digital recorder with a removable SmartMedia card, a docking station with a SmartMedia card slot, and the Walkabout Desktop application. The Quest is equally suitable for single users and workgroups using SMTP/POP3 e-mail systems, although the device is compatible with only one PIM other than itself—Microsoft Outlook.

The portable digital recorder has a digital signal processor and a frequency range of 300 to 3,400 Hz, and it stores up to 2,000 PIM records in its internal 512K memory. Voice recordings in WAV file format are held on 2MB (included), 4MB, or 8MB Samsung SmartMedia cards.

The Quest runs for approximately 10 hours on two double-A alkaline batteries (included). It can also run on nickel cadmium rechargeable batteries. Available options include an AC adapter (\$10 street), conference microphone (\$100 street), and telephone adapter (\$100 street).

At 5.4 ounces and measuring 4.8 by 2.6 by 0.9 inches (HWD), the recorder is pocket-size. It has a 2.4-inch-diagonal stylus-based, back-lit screen, which is small for a PDA and does not lend itself to input, especially with the Quest's tiny virtual keyboard and stylus, but the system is fine for reference use. The menus are concise and the slide-dial positions for recording and playback are clearly marked.

The Quest produces clear, static-free voice recordings. You

can store and manage voice files in 14 folders, designate them for e-mail, or attach them to contacts, appointments, or to-do list items.

Recording features include up to ten cue marks per recording for quick searches and three file-compression formats to balance recording time and quality. The docking station includes a parallel cable, nickel cadmium battery charger, and synchronization button for exchanging voice recordings and



TINY: The Quest's 2.4-inch-diagonal screen is too small for input.

e-mail between a SmartMedia card and Walkabout Desktop.

Walkabout Desktop software lets you upload, review, edit, and create voice recordings before sending them as e-mail with text messages. It also synchronizes multiple users' appointments, to-do list items, and contacts with voice attachments between Quest recorders and

Microsoft Outlook or Walkabout Desktop.

If voice recordings match your productivity style, the Walkabout Quest may fit your needs.

Dictaphone Walkabout Quest. Street price: \$370. Requires: 32 MB RAM (64MB recommended); 30MB hard disk space; Windows 95 or 98. Dictaphone Corp., Stratford, CT; 800-483-6266; www.dictaphone.com.

A Secure Managed PC

The HP Vectra VL8 MT is an impressive solution for the corporate desktop.

By Carol Venezia

Large companies are becoming increasingly worried about security of information at the desktop level. For many, password-based security through Windows NT just doesn't cut the mustard. If a more heavy-duty solution sounds appealing, consider the HP Vectra VL8 MT PC, with HP's ProtectTools Smart Card Accessory Kit.

This Vectra (\$2,200 street) is a smart, secure, corporate asset that's easy to manage and service. Hewlett-Packard offers the ProtectTools Smart Card Accessory Kit, which includes a Gemplus PC/SC-compliant smart card reader, two smart cards, and the software you'll

need to use it. This solution replaces the Windows NT log-on password with a two-level authentication process; you can access the PC only if you have a valid card and PIN.

Ease of serviceability was a major design focus for the new Vectra mini-tower, and it shows. To access the interior, simply unlock the system, lift a handle on the top edge of the side panel, and that panel comes right off.

The lower half of the Vectra mini-tower

SAFE AND SMART: Your HP Vectra VL8 MT is well protected via Smart Card.

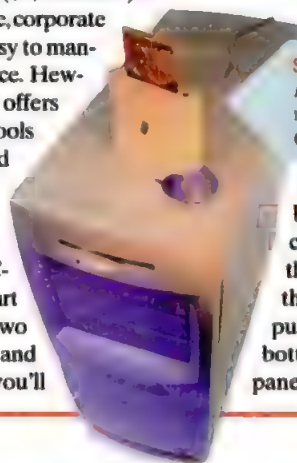
hosts the motherboard and expansion-card riser. To remove the motherboard, lay the system on its side, pull on a handle on the bottom panel, and that panel flips down like a

trapdoor. You'll then have access to the motherboard. Lift and flip a lever; the NLX board slides out for servicing.

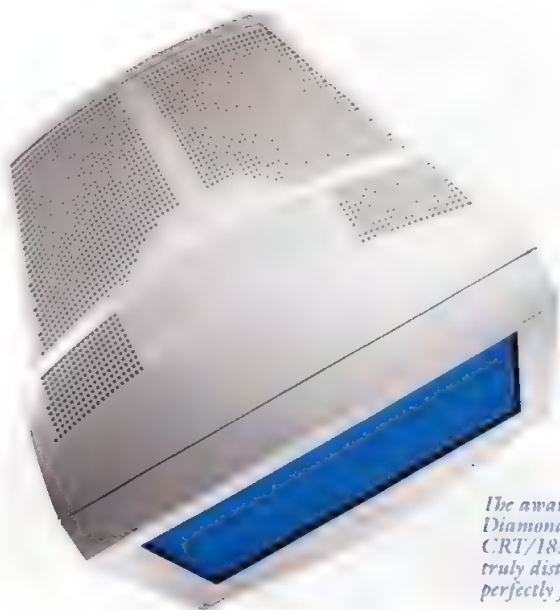
The tool-free theme is even carried through to the expansion slots—just remove a metal back-plate, and you can add or replace cards easily. These slots are located on a riser, which also holds connectors for the primary IDE and floppy disk controllers.

It's easy to see why Hewlett-Packard is a market leader in corporate managed PCs. The company's TopTools Web-based management platform is second to none, its Vectra PCs are the picture of serviceability, and you can purchase Vectras with an advanced security solution that's tested, validated, and integrated into the HP platform.

HP Vectra VL8 MT. Street price: with 500-MHz Pentium III CPU, 128MB RAM, 13.5GB hard disk, Windows NT 4.0, 32X CD-ROM drive, HP ProtectTools Smart Card Accessory Kit, \$2,200. Hewlett-Packard Co., Palo Alto, CA; 800-322-4772; www.hp.com/desktop.



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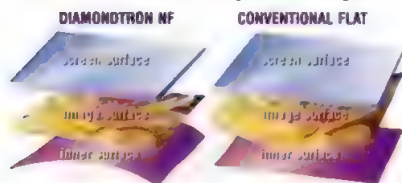
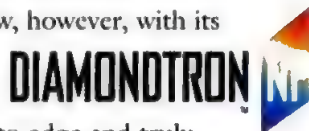
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Network All-in-One

The Technaunts eServer 152-E provides all the services your small network needs.

By Les Freed

The new Technaunts eServer 152-E (\$1,995 list) combines Web, e-mail, printer, and network file services into one small, easy-to-install box. In addition to server duties, the eServer acts as a basic firewall and Internet sharing device for small networks. Despite the eServer's enormous flexibility, it is very simple to install and administer.

The eServer is essentially a Linux-based PC with a 133-MHz Pentium processor, 16 MB of RAM, and a 1.6 GB hard disk—all packed in a cigar-box-size cabinet. Although the front and rear panels provide the usual PC connections (keyboard, mouse, serial, and parallel ports), you don't need a monitor or keyboard to install and then operate the eServer. The rear panel provides two Ethernet connections: one 10/100 connection goes to your LAN, and the other 10-Mbps connection goes to your Internet provider via a router, cable modem, or DSL connection.

The eServer runs Red Hat Linux 5.1, but you don't need to know a thing about Linux to install and use the system. To install the eServer, you run a Windows-based configuration program from the included floppy disk and provide IP naming and addressing information for the eServer. Once you've set the IP addresses, you can administer

and monitor the eServer from any browser on the Internet or on your LAN. We had our eServer up and running in about 15 minutes. Die-hard Linux gurus can attach a monitor and keyboard to the eServer to access the Linux command line.

We were impressed with the eServer's simple, elegant user interface. The left side of each screen provides several navigation but-

ONE VIEW:
One glance at the eServer's Welcome screen gives you general usage information.

LINUX INSIDE
With a copy of Red Hat Linux at its core, the eServer will support virtually any client.

tons, and the right side contains configuration or status information. The configuration details are logically split among several screens, so you never feel over-

whelmed by technical details. The top-level display does double duty, displaying the main configuration menu on the left and an informative, real-time status display on the right.

THE WAY TO THE WEB

The eServer includes Technaunts' own Web and SMTP/POP3 servers. The Web server has a

built-in Web mirroring feature that allows it to download and republish data from another Web site on a schedule. We were able to use this feature to duplicate the PC Magazine Web site on our local LAN in its entirety. Links for the mirrored site are automatically converted to point to the local server's URLs instead of the original server's URLs.

Web publishing is simple, thanks to the included Samba SMB server. Samba makes the eServer's hard disk appear as a shared disk on the LAN. Users publish files on the Web server by copying HTML files onto the shared disk. We initially had trouble connecting to the SMB server from the Windows 98 client PCs on our test LAN. This was due to Samba's lack of support for Microsoft's encrypted authentication protocol; a simple reg-

als can manage their own mail accounts without involving the system administrator.

ESERVER SECURITY

The eServer's built-in firewall provides IP packet forwarding between the network and the Internet. The firewall uses Name Address Translation (NAT) to handle address mapping between the LAN and the Internet, and it provides a DHCP server to assign IP addresses to client PCs as needed. This allows the eServer to share a single registered IP address with all the PCs on the network, and it prevents outsiders from gaining access to LAN-connected PCs via the Internet. The firewall's throughput proved very good, easily keeping up with our 4-Mbps cable modem connection.

Technaunts offers two other models of the eServer. The model 152-M has a single 10-Mbps Ethernet interface and includes a V.90 modem for dial-up Internet access. The model 150 has a single 10-Mbps Ethernet interface and no modem, making it suitable for intranet applications.

SET IT UP: Bullet point and a simple interface make configuration and maintenance easy.

If there is one weak spot in the eServer, it's that it represents a single point of failure. If the eServer goes down, your Web, e-mail, and Internet access go down as well.

At \$1,995, you could probably duplicate much of the eServer's functionality yourself by buying a basic PC, installing Linux, and adding your own Web and e-mail servers. But your home-grown server would take significantly longer to install, and it wouldn't have the eServer's integrated management interface. **Technaunts eServer 152-E.** List price: \$1,995. Technaunts Inc., Morrisville, NC; 919-462-1434; www.technaunts.com.

FLEXIBLE E-MAIL

The e-mail server supports multiple domain names, so you can use it to host e-mail for several organizations at once. You can allow or deny access to the mail server based on domain name or IP address, thereby providing a front-line defense against e-mail spammers. Mail account management is done through the browser interface. Individu-

Adding Modems via USB

Ease the installation of new modems to your remote-access server with the Rapidport/4.

By Steve Rigney

By taking advantage of the plug-and-play features of USB, Inside Out Networks has solved the problem of adding new modems to a server that is out of both slots and resources. The Inside Out Networks Rapidport/4 (\$1,399 list) houses four V.90 56-Kbps fax modems and connects to a Windows 95, 98, or NT 4.0 system with a USB port.

The Rapidport/4 unit includes the modem chassis, four phone lines, and a USB cable. Because the modems require more power than the USB port provides, the product also includes a power cable. Even with the phone lines, USB cable, and power connector, the Rapidport/4 creates less of a cable mess than a multiport I/O card and a stack of external modems.

An extra upstream USB port on the unit lets you connect another USB device such as a hub or a second Rapidport/4. You can even daisy-chain four Rapidport/4 units together, for a total of 16 modems on a single USB port.

If you are using a USB-compliant operating system (such as Windows 95 OSR2 or Windows 98), you do not have to install any additional software for the unit to recognize and configure the modems.

As Windows 95 and 98 do not provide any remote-access server software, most administrators will want to use the Rapidport/4 on a Windows NT-based system running Micro-

soft's Remote Access Services (RAS). And since Windows NT 4.0 does not work with USB devices out of the box, Inside Out Networks had to write its own Windows NT USB stack and drivers. The installation of these drivers is simple, and after you connect the modem unit, all you have to do is run a short utility that copies the USB drivers to the Windows NT server or workstation.

FASTER CONNECTION: You can use the Rapidport/4 with Microsoft Multilink PPP to bond together all the modems and speed up your Web connections.



After we installed the modems on our Windows NT server, we used the RAS control panel to configure the modems and remote users. The modems appear as communication ports,

starting with COM5. Because the modems are recognized as standard ports, you can use any Windows-based communications software, mail server, or bulletin board system.

The Rapidport/4 works with Microsoft Multilink PPP, so you can bond all four of the unit's modems together to increase your bandwidth to the Internet or to a remote-node connection. In addition, you can use RAS's routing features to make the Rapidport/4 a network device that multiple simultaneous clients can use to access the Internet.

The Inside Out Rapidport/4 is designed for small and branch offices running Windows NT RAS; it is a simple device that solves an important need for both dial-out and dial-in connectivity.

Inside Out Networks Rapidport/4. List price: \$1,399. Inside Out Networks Inc., Austin, TX; 512-301-7080; www.ionetworks.com.

Proficient Switching

Support a more efficient network with Intel's new InBusiness 8-Port 10/100 Switch.

By Les Freed

If you think that only large networks can benefit from Fast Ethernet switching, Intel wants you to think again. The company's new InBusiness 8-Port 10/100 Switch (\$499 list) costs only about \$56 per port—not much more than a standard nonswitching 10/100 hub. The InBusiness Switch is very simple to install and set up, and it provides a fast, easy way to relieve local area network (LAN) congestion.

We tested the InBusiness Switch on a small LAN with five workstations and one Windows NT Server using a variety of 10- and 100-Mbps NICs. We also tested in-

teroperability between the Intel switch and several other vendors' Fast Ethernet hubs and switches and encountered no problems.

The InBusiness Switch is packaged in an attractive gray cabinet that can be

stacked with other InBusiness modules. Like many small 100-Mbps hubs and switches, the device contains a small cooling fan that makes some noise. The InBusiness Switch is designed to be desktop-mounted, with all the connectors on the rear of the unit.

The front panel hosts eight color status LEDs and a power switch with its own LED. The status LEDs light up in green for 10-Mbps connections and in orange for 100-Mbps connections, and they blink to indicate activity on a particular port. The rear panel holds nine RJ45 connectors, one for each port, plus an uplink port for connecting additional switches or hubs.

Intel Corp. has included many extras to help you get started. The InBusiness Switch

comes with a full-color setup poster, which you probably won't need. The switch does not require any configuration or additional software, so setup is just a matter of connecting the cables and turning on the unit. The poster does contain some helpful diagrams that show how to use a switch to reduce LAN congestion, and an included Networking Basics booklet provides additional network setup and performance tips in simple, nontechnical terms.

The low cost of the Intel InBusiness 8-Port 10/100 Switch and the throughput benefits of switching should convince the administrators of even the smallest networks that switching is a viable solution to the problems associated with an overcrowded network.

Intel InBusiness 8-Port 10/100 Switch. List price: \$499. Intel Corp., Hillsboro, OR; 800-628-8686; www.intel.com/network.



STACKABLE: Intel InBusiness hardware can be stacked to save space.

Superior Store and Share

The Axis StorPoint makes CD sharing faster and easier, even for mixed network environments.

By Steve Rigney

The biggest hurdles to sharing CDs on a network have typically been low performance, heterogeneous clients, and high cost. Axis Communications has developed a thin-server CD storage technology that helps resolve at least two of these issues. The Axis StorPoint CD E100

NetWare, and Unix clients using the NetBEUI, IPX, or TCP/IP protocols.

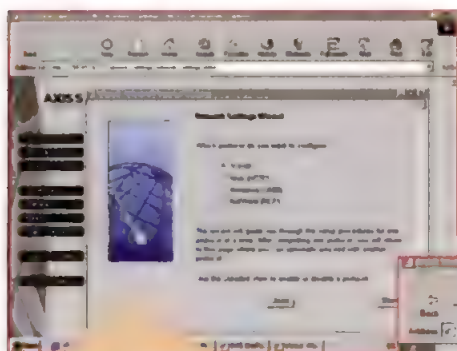
The StorPoint is designed to work with any OS running on any network. To that end, the product includes multiple installation methods. For example, the server can retrieve an IP address from an existing DHCP host, or you can use the Address Resolution Protocol to assign an IP address or use the bundled WinPoint Windows utility to configure the unit. WinPoint relies on either the Microsoft Windows networking client or the NetWare

staller, which was able to auto-detect the StorPoint without relying on the Windows or NetWare network transport. After we configured the unit with an IP address, we switched to our browser to perform other tasks.

We used a standard browser to connect to the StorPoint, see all of the CDs and DVDs, and configure the device. We were able to set up the caching parameters, configure user access, and create shared volumes. Other products, including the Microtest DiscPortVT (Networking First Looks, April 6, 1999), also provide Web access to shared CDs on a server. Both products let you limit or re-

archive copy. The mirror copy of the CD lasts only for as long as the CD is in the drive. Archived copies last until you delete them manually. Though other products, such as the Microtest, offer the ability to cache CDs to an internal hard disk, they don't provide both a mirror and an archive option. Caching also lets you use the Stor-

CHECK UP:
You can use any standard browser to monitor the activities of your StorPoint servers.



WALK-THROUGH:
The StorPoint includes browser-based wizards to take you step-by-step through tasks.

supports multiple protocols and OSs and has the ability to cache CDs

to both hard disks and RAM. Other helpful features include a Web interface for managing and accessing the CD and DVD volumes.

THE PERFECT OPTION

The StorPoint is not sold as a standalone unit but is bundled with third-party CD- and DVD-ROM chassis. To test the StorPoint, we looked at a CD storage server as well. We chose one from Excel Computer (\$6,290 list), one of Axis's hardware resellers. The Excelerator Plus-S is a seven-bay device that includes the StorPoint, a 10/100-Mbps Ethernet connector, one DVD drive, four CD-ROM drives, a 36GB SCSI hard disk for caching, and 96MB of RAM. The Excelerator Plus-S, like all CD storage servers from Excel, works with Windows NT, Novell

client on your Windows desktop to auto-discover all of the StorPoints on your network.

Unfortunately, we were unable to use WinPoint to browse our Windows network, because our workgroup name was different than the one stored on the unit. When we tried to use the NetWare client method on our Windows NT 4.0 test PC, we found that WinPoint doesn't work with the Microsoft NT NetWare client. We finally found a new utility on the Axis Web site called Axis IP In-

YOUR CALL: You choose the type of cache and how much disk space to reserve for caching CDs and DVDs.

move browser access to any CDs as well as to the server itself.

PUSHING PERFORMANCE

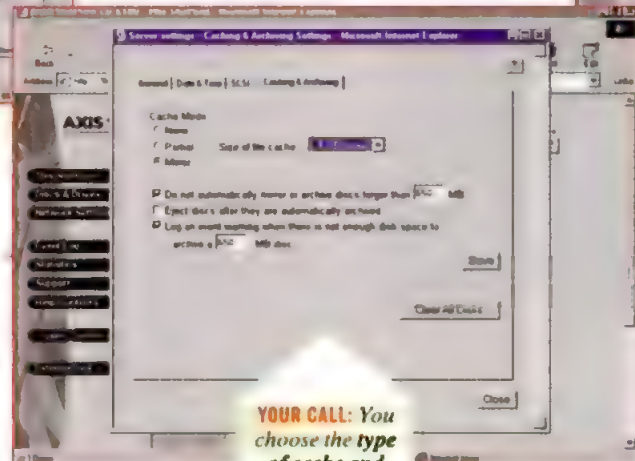
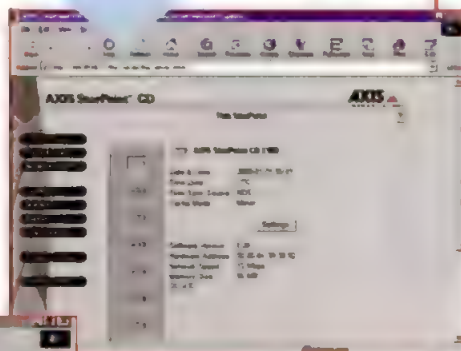
The StorPoint relies on two things to increase performance. The first is hardware. The StorPoint includes the Etrax 100-MHz 32-bit RISC processor and holds up to 160MB of RAM and includes 4MB of on-board Flash memory. The second relies on caching: Whenever you insert a CD or DVD into your tower, the unit can either make a mirror copy of that CD on the hard disk or make a permanent

Point to replace larger, more expensive CD jukeboxes.

You can choose to mirror or archive a disk on demand or automatically. On our tests, we configured the StorPoint to make an archive of any disk we inserted and then eject that disk when the image was complete. If the hard disk runs out of space, an error message is automatically sent to a log file.

Axis StorPoint Disco is a Windows-based utility that comes with the StorPoint. It allows you to find all of the CD, DVD, and other Axis storage devices on your network. Once you have gathered all of the devices, you can use Disco to create folders for sharing them. You can even map a drive to a folder, and whenever you drag a CD or DVD to that folder, it is automatically assigned that drive letter.

Axis StorPoint CD E100. List price: Bundled with CD storage servers, including the Excel Computer Excelerator Plus-S, \$6,290. Axis Communications, Woburn, MA; 800-444-2947; www.axis.com.





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Graphics Cards Redux

By Nick Stam

On February 8, we downloaded nVidia's latest graphics card driver, Detonator, from its Web site (www.nvidia.com) and tested it with an Editors' Choice-winning Creative Labs Graphics Blaster RIVA TNT card in the same Pentium II/400 Dell system we had used in our roundup of graphics cards (December 1, 1998). Sure enough, we validated nVidia's claims: There was a tremendous improvement in performance on our 3D WinBench tests using DirectX 6.

After seeing our initial test results, we were suspicious of the driver; such improvements are not normal, especially since we had uncovered discrepancies between the cards we tested for the roundup and identical cards taken from store shelves shortly thereafter. Having spoken with 3D WinBench developers at the Ziff-Davis Benchmark Operation and with nVidia, we became convinced that the driver is clean (in other words, the vendor is not cheating on our tests).

We then wondered whether nVidia had done something wrong in its earlier reference drivers. The company told us that its original drivers did not use the second pipeline of its dual-pipeline hardware architecture efficiently in all cases.

Detonator is much better optimized for single-pass, multi-texture operations under DirectX 6. (Note that single-pass multitexturing hardware is not supported under DirectX 5.) Many other improvements were added to Detonator, including texture memory management optimizations, tuning for Pentium III and Streaming SIMD Extensions, and tuning for AMD K6-2 and 3DNow!

The test results: Running the

3D WinBench test on the Creative TNT card at 1,024-by-768 resolution with 16-bit color depth, a 16-bit Z-buffer, and a 85-Hz refresh rate yielded a score of 475 on our original tests. Detonator increased the score to 670—a 41 percent improvement.

At the same resolution with 32-bit color depth, the score rose from 298 to 460, a whopping 54 percent gain. At 1,280-by-1,024 resolution with 16-bit color, the score improved from 298 to 427. We also ran our 2D WinBench and Winstone tests,

and the results were virtually identical, varying by less than 5 percent in all cases. Finally, we obtained a beta revision of Creative's new Detonator-based driver and ran spot tests using 3D WinBench and Business Winstone; the results were identical to those with the nVidia reference driver.

The moral: Optimized drivers play a huge role in graphics card performance. Always look to your PC or graphics card vendor's Web site to download the latest drivers.

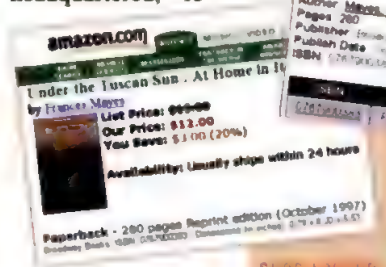
Show Me the Relationship

By Don Willmott

On our December 1998 online list of the Top 100 Web sites, which was also included in the issue of February 9, 1999, we identified what we considered to be the five best online shopping sites: Amazon.com, CompareNet, MSN CarPoint, NetMarket, and Shopping.com.

It was our inclusion of Shopping.com that drew the most fire from readers. We praised the site for the size of its inventory—more than 2 million products—but noted that the lack of a global search engine forces you to guess in which category the item you're looking for resides. It turns out that Shopping.com had a rough year in 1998: It enjoyed a phenomenal

growth in its customer base but couldn't keep up with all the orders. In the course of the year, the Better Business Bureau in southern California, where Shopping.com is headquartered, re-



ceived 56 complaints.

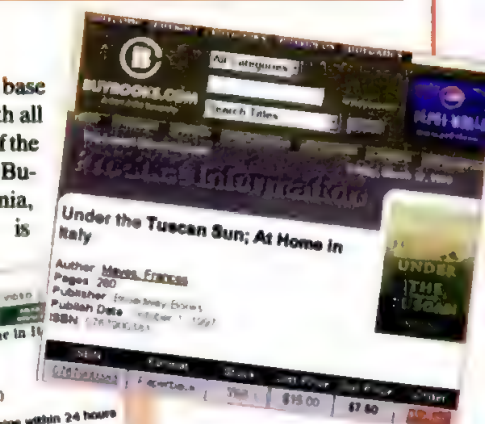
Then in January, Compaq Computer Corp. announced plans to acquire Shopping.com to help bolster Compaq's emerging online presence. But it's too early to tell what impact the Compaq buyout will have on Shopping.com's spotty service record.

Some dissatisfied Shopping.com customers sang the praises of Buy.com, a site that has grabbed headlines recently for vowing to beat any price, even if it means selling below cost. In fact, the computer-selling branch of Buy.com (BuyComp.com) was included on our list of top sites in the Computer Shopping category. (Softbank, the majority shareholder in the parent company of PC Magazine, is an

investor in Buy.com.)

The other sites in our top five didn't elicit any complaints about service from readers. Rather, Amazon.com

was praised repeatedly for its speedy delivery and excellent customer service. Nervous competitors say that Amazon.com won't be as dominant in the new markets it has entered, but shoppers seem to be voting with their dollars. Amazon.com's nearly 5 million registered members have already made Amazon.com's music store a big success, even though, as is the case with book shopping, they can probably find slightly better prices if they shop around. Amazon.com has proved that in many cases, online shoppers value a close relationship with an online store more than they value the chance to save a few dollars here or there.



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I have personally found [Buy.com's] service to be prompt and reliable, as well as offering the cheapest (usually) prices on the Net. I actually try to buy things from the service because of its distribution centers. I can order something, have it shipped ground, and receive it in two days.

—J. Wong

Buy.com is not a company that I could recommend. Buy.com does not honor prices posted on its Web site, its customer service is atrocious, and it gouges on shipping fees.

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The image shows a screenshot of the CDW.com website's shipping calculator and shopping cart tools. The calculator is titled "Quick Shipping Calculator" and shows shipping costs for "NEW JERSEY". It lists various shipping options with their respective prices:

Shipping Option	Price
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Airborne Express Overnight	\$14.75
Priority Mail	\$16.45
FedEx Economy 2 Day	\$18.31
UPS Mail	\$18.31
FedEx Standard Overnight	\$33.81
Express Mail	\$34.75
FedEx Priority Overnight	\$38.31
UPS Next	\$38.31

Below the calculator is a "Shopping Cart Tools" section with links for "View Cart", "Checkout", and "Shipping Calculator". The "Shipping Calculator" link is highlighted. To the right, a "REAL SELECTION" banner is visible, along with a table showing product prices and shipping costs:

Product	CDW Price	In Stock	Price
2000 Palm III	199.99	Yes	\$199.99
2000 Palm III	199.99	Yes	\$199.99
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ISPs: Doomed to Extinction?

Internet service providers are a vanishing breed. Or so say the prognosticators, who posit that cable modem services and digital subscriber lines leave the local or regional ISP out of the equation, just another middleman with no value to add. Companies can go directly to their telcos and get all the connectivity they

need. Individuals can go to huge national service providers such as AOL and AT&T with portal and content services. Caught in this dual squeeze, the local ISP has no reason to exist. Or so the theory goes.

I presented this scenario to Rich Bader, president of EasyStreet, a popular Portland, Oregon-based ISP, which is growing at a rate of 70 or 80 percent per year. EasyStreet specializes in small and medium-size businesses and has had, pundits notwithstanding, great success in selling DSL-based services to them. Bader says that the pundits aren't entirely wrong: Their scenario applies to individuals and large companies but not to smaller businesses.

Big companies have seasoned telecom experts who can work with telcos to get the kind of connectivity and bandwidth they need. They also have networking and Internet expertise, so they can secure domain names, set up e-mail accounts, configure servers, and provide users with the software they need to use the Internet effectively.

Bader, whose engineering background shows in his choice of phrases, says, "There's an impedance mismatch between small companies and big telcos." Despite their best efforts, telcos don't really understand how businesses use PCs and are not equipped to address their needs and questions. "It's a computer problem, not a telephony problem," Bader says. "The pipes that connect the businesses to the Net are incidental to the more fundamental challenge of giving companies what they need."

Bader's customers are companies with employees numbering from 5 to thousands, but most range from about 50 to 200. A small company's needs are pretty much the same as a big company's. The difference is that a small company usually has no IS staff, or if it does, the staff is consumed with everyday problems and often has to experiment to find out how to set up a mail server, run FrontPage extensions on its Web server, implement security, manage domains, and do dozens of other specialized tasks.

Bader says that these are the tasks that a regional ISP performs with ease, while they remain beyond

the ken of most telephone companies. A local ISP can relieve small businesses of managing these tasks, freeing them to concentrate on their business.

EasyStreet's EasyDSL service is a good example of its synergistic relationship with telcos and businesses. The phone companies provide the DSL service, but EasyStreet provides the support, software, and configuration expertise. By tailoring bandwidth and service offerings to a wide variety of customers, it keeps the service affordable and comprehensive. Among business services, for example, EasyStreet offers packages for SOHO, small-office LAN, and corporate connections. Its Web site takes pains to explain, as nontechnically as possible, the various options and the pros and cons of each. For its largest customers, it encourages (because of guaranteed bandwidth) frame-relay connections up to T1 rates.

Imagine the plight of the small-business owner who hears that the telco offers high-speed lines, orders frame-relay or fractional T1 service, and has it installed. Then the installer says, "Where's your router?" Router? Nobody mentioned a router. Or security. Or a Web hosting server.

The savvy ISP tells the customer exactly what is needed to connect PCs to the high-speed line. It offers configuration templates and gateway services from existing corporate mail systems to the Internet, and it will actually place the line order with the telco, ensuring proper configuration. A smart ISP will also work with local VARs and systems integrators to make sure that the customer's network is properly configured and has all the necessary equipment.

ISPs provide a necessary link in the complex chain from the Internet to the small-business user's desk. EasyStreet is only one of many competent ISPs, but its Web site and range of services could serve as a blueprint for how to do it right. If you're in the market for comprehensive Internet services for a small business, take a look at www.easystreet.com. Compare local vendors' offerings with what you find there. And if you can't find a comparable service, you could always consider moving to Portland. **PC**



ISPs provide a necessary link in the complex chain from the Internet to a small-business user's desk.

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Convenience vs. Control

We're all getting dumber and dumber. The need to simplify computing came back to roost a couple of times over the last few weeks, most recently when I installed a Kodak 323 tethered camera to use Microsoft NetMeeting and CU-SeeMe for Internet calling. I have an ADSL line, after all, which is perfect

for video. Unfortunately, I could remember nothing about the software.

Having installed both NetMeeting and CU-SeeMe in the past, I was amazed at how little knowledge I retained. The only thing I did remember was that Microsoft's miserable NetMeeting servers are always overloaded. For a company that wants to take over the world, you'd think Microsoft would get this lone subsystem straightened out.

Once I finally got on a server, I never managed to connect to anyone and was generally confused by the menus and icons. I'm sure I'll end up spending a lot of time figuring everything out, but will I forget it again? This does not bode well for the industry.

A better example came a few months ago, when someone borrowed an old laptop to browse the Web. It had a 486, Windows 3.1, and not a lot of memory. I could barely remember how Win 3.1 worked, although I had used it for years. It should have been easy, but it wasn't; it was annoying. I don't have this much trouble with DOS, but I still use DOS. I often open a DOS window and run some odd utility. I haven't touched Win 3.1 for almost four years; I was clueless. I also realized that by today's standards (actually by any standards) it really stunk!

Forgetting how things operate is a new problem nobody is discussing. Microsoft is talking about simplifying things to excess in the form of Neptune or Windows 2001 or whatever, but this doesn't solve the bigger problems. Simplifying the OS shell makes the machine less powerful and stupefies the user, making applications seem harder.

It's still the applications themselves that we must operate. The most powerful programs, such as Adobe Photoshop and Macromedia Director, are impossible to play with casually. If you stay away from them too long, you almost have to start learning them all over again. This is made worse by never-ending updates.

Photoshop 4 and 5 are almost completely different, and the changes will confuse a casual user. Seasoned users will tell you these packages are for professionals who use them day in and day out, so my concerns are

not important. But NetMeeting is not for pros; it's a general-purpose tool, and it has roadblocks, too.

The original Macintosh crew had the right idea when they rigidified the GUI so software packages had to comply with specific requirements. During the Mac's first years, the most interesting thing about the machine (besides that fact that you could plug it in and it worked immediately) was that the uniformity of the various software packages meant users could quickly get up to speed on new applications. This became a selling point.

This thinking fell by the wayside when Apple became distracted by HyperCard, a development system with an open user interface that was going to take over the world. Over time, company after company ignored the UI constraints and managed to develop their own peculiar interfaces. In the 15 years that have passed, this idea of similarity as a route to improved ease of use was forgotten. If there's one thing killing off the applications business, this is it. People don't have time to struggle with more than one or two packages.

Curiously, one thing ignored in all this is that the improvements many of us complain about are clearly beneficial when we look at the old product (Win 3.1, for example). I'm reminded of a recent experience using my old Pentax Spotmatic II after growing accustomed to my Nikon F4. I could barely remember how to set all the things that needed setting. The philosophical battle between control and convenience will always be won by convenience.

The convenience side of the equation moves the intelligence from the user to the object: smarter software for dumber users. I could sense my own dumbing down as I tried to operate the Pentax or Windows 3.1. Neither used to be difficult, but now my neural pathways have been altered by newer, better, more convenient systems. The idea is that by having machines do the thinking we are freed up for other things. This may be true, but why does this process have to make us feel like idiots when we try to backtrack? Apparently we're not going to be able to backtrack much anymore.



The convenience side of the equation moves the intelligence from the user to the object: smarter software for dumber users.

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INSIDE TRACK

Rethinking Jupiter Dept.: I was recently shown a large-format Jupiter machine under embargo, and it gave me some reasons to reconsider my thoughts on such devices. As you know, Jupiter machines are Windows CE-based computers designed to fall somewhere **between** subnotebooks and palm-size PCs. Some makers are now calling them mini-notebooks. This means the categories of portable machines go from hand-held to mini-notebook to subnotebook to notebook to laptop.

The appeal of the mini-notebook is tenuous, because its characteristics could be duplicated by a fully compatible Windows machine with a few changes in both Windows and the processor. But I think these changes will never happen, and if you need a Jupiter's features, then you'll have to buy one.

The Jupiter's selling points are extreme light weight, ROM-based instant-on OS, long battery life, and low cost. There tends to be no power switch: Just open the case and the unit turns itself on. The device can run for **12 hours or more**. There will probably be no hard disk in the new systems, but expect to see CompactFlash memory modules. These machines should be networkable. One device I saw using a MIPS-based chip was powerful enough to **decode MP3 songs** in real time, making it a cool substitute for a CD player on an airplane. With 12 hours of battery life and an IBM PC Card 340MB hard disk plugged in, you could play about 350 minutes of music.

I'm still not sure where the Jupiter device fits into the scheme of things, with various incompatible processors and **essentially closed systems** running all Microsoft software. But as a device to take on the road, it might work for a lot of users.

More on MP3 Dept.: Over the past few months, **MP3 has exploded**. I now believe this was a direct result of the attention it got when the RIAA (Recording Industry Association of America) stupidly sued Diamond Multimedia over the Rio player. Millions of people who were **unaware of MP3** were suddenly learning all about it. I'd be interested to find out exactly who at the RIAA promoted the lawsuit, which was really nothing more than a nasty nuisance suit. Then I could ask that person, "What were you thinking?!?"

When the argument is made that MP3 isn't just about bootlegging songs, it doesn't take much more than a simple visit to www.mp3.com to see how true that is. When I first discussed MP3 years ago, this site did little more than distribute some shareware players and talk about MP3 as a technology. Now it's a repository for **thousands and thousands of songs** being given away as free samples from every kind of musician and band.

There are 24 genres of music listed on MP3.com, each listing hundreds of bands, and each band posts up to four songs that it is giving

away as promotion. For example, as I'm writing this, there are **3,128 rock bands** listed with music you can download. (There were 2,700 bands a few days earlier.) From the blues category, I downloaded 40 tunes, which I cut down to 17 and burned onto a CD to listen to at my leisure. I discovered performers I would have otherwise never encountered. Many bands have full CDs of their material for as little as \$4.99 each, sold directly from the MP3.com site.

The kicker to this is Microsoft's plans for MP3. As I've mentioned before, Microsoft's media player has long since begun playing MP3 natively. According to its plans for Windows 2001, or Consumer Windows (a.k.a. Neptune), **MP3 is a key element** in two of its four "Key Focusing Scenarios" for its next-generation OS.

The Microsoft strategy is to **focus on four scenarios**. In order, they are Wintone, Digital Media Hub, Home Network, and Online Consumer Services. I will be discussing these strategies in more detail in the months ahead, after I **decode some of the acronyms** Microsoft uses internally. But suffice it to say that MP3 is part of the overall Microsoft scheme.

When discussing the PC as a "Digital Media Hub," Microsoft says, "The user can also grab MP3 files from the Web, free or paid for, ... or audio files from a music CD ... [and] stamp [them] to a CD for playback in the car." And when discussing Home Networking, the company says, "You can route MP3 to your A/V center." Thus, MP3 is a part of two of the four Microsoft strategies for the computer of the future.

Whether Microsoft's elaborate schemes can come to fruition remains to be seen. MP3 may prevail, but Microsoft is **banking on** something called a Passport, which allows a user, once identified, to go from place to place on the Net or within his or her own system and be "known." The idea is to **save time** with passwords when buying goods from different vendors by not having to provide redundant information.

Unfortunately, **part of the Passport scheme** seems to involve the now-controversial **GUID (Globally Unique Identifier)**. GUID works by looking at your Ethernet card ID and telling Web sites (and whomever else) who you are. The GUID can also tell what you did. It's believed that Word files and Excel worksheets as well as PowerPoint slides have **various types of embedded-ID information**.

The levels at which this information is embedded are unknown, and this characteristic is possibly one of the reasons Microsoft **has not been open** about revealing the **exact file structure** of its various file types. Even when a read-only file is opened, for example, changes are made in many MS files anyway. For what? Microsoft is now being asked these questions. There could be **an embedded list of everyone who ever looked at a file**. Privacy concerns and Big Brother fears will derail many of Microsoft's future plans. **PC**

MP3 has exploded.

I now believe this

was a direct result of

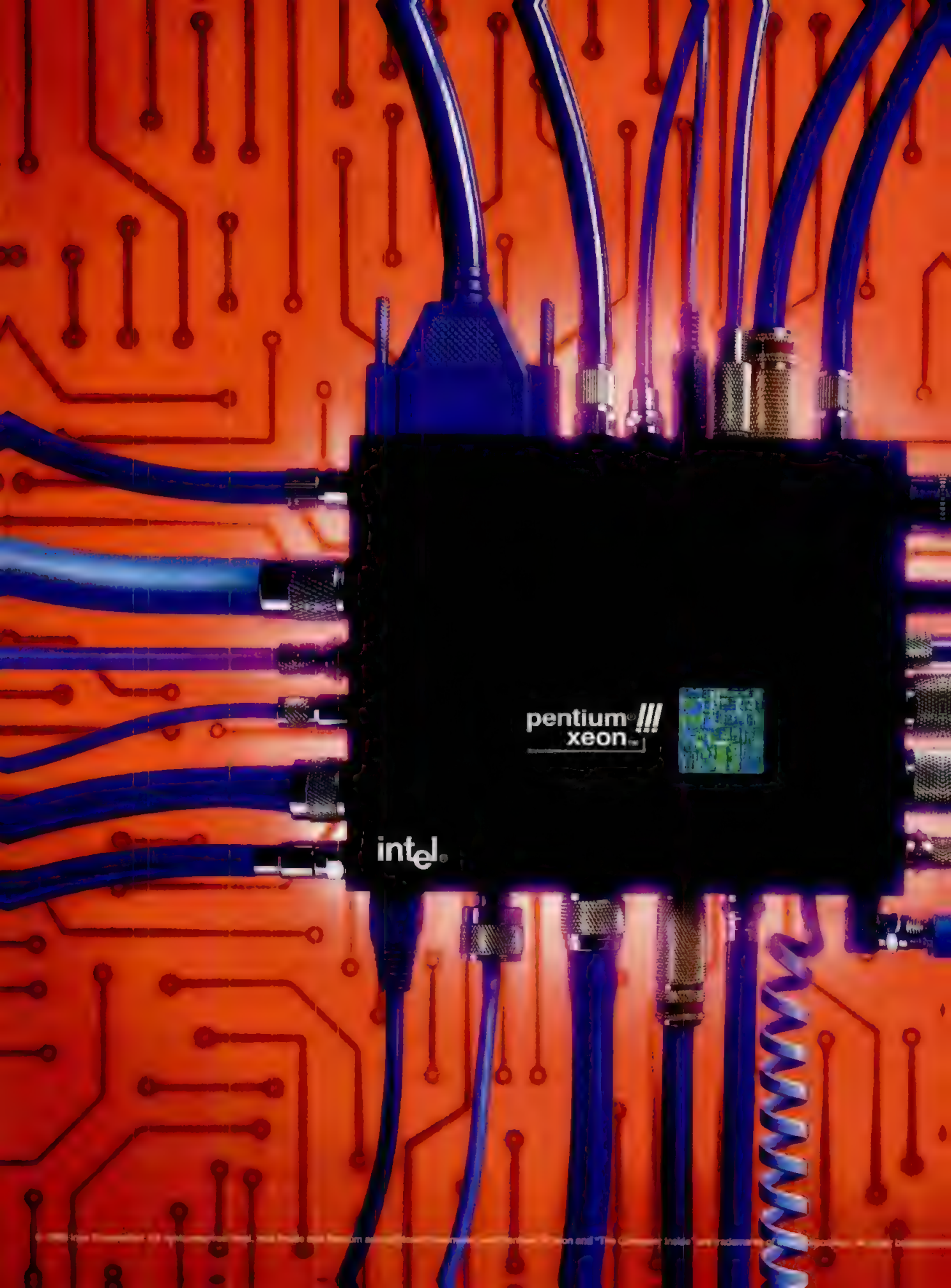
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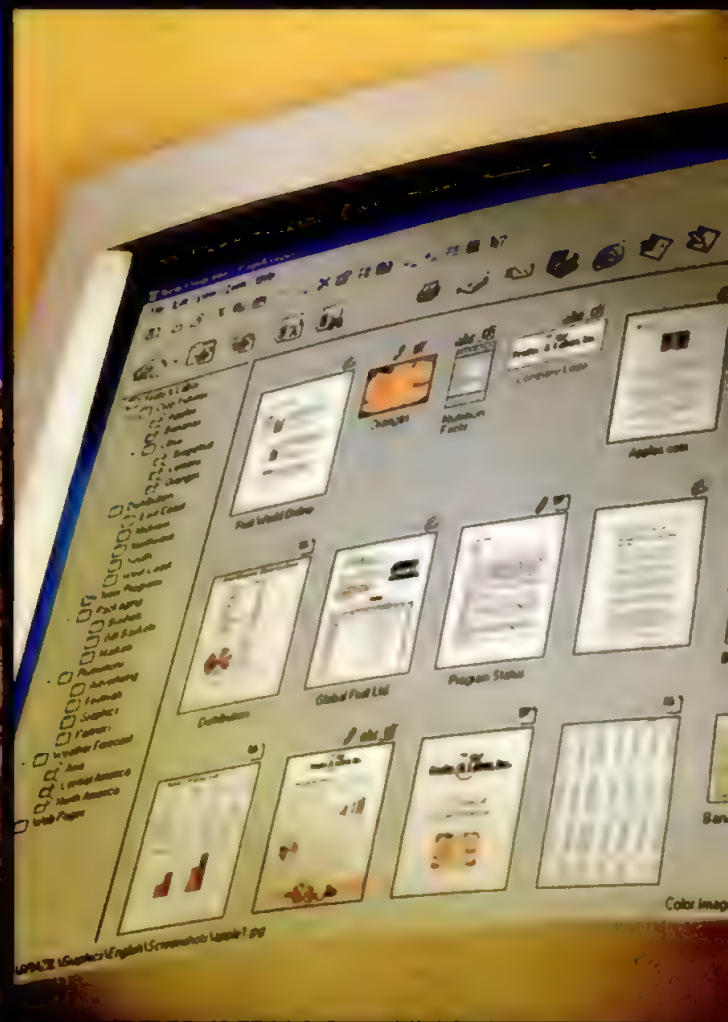
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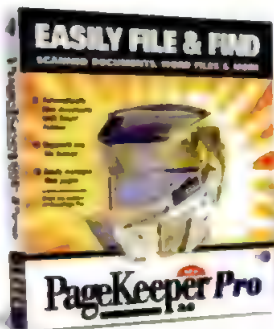
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The D-Word and the Web

It's funny how our understanding of new things evolves. *E-commerce* is a good example. If you'd polled Internet users at, say, six-month intervals over the past several years, asking just what they thought that term meant and what e-commerce could contribute, you'd have gotten wildly different answers every time.

In the early days, you'd mainly have heard howls of protest from "pure" Internet users—those who grew up on ARPANET before it was transformed, and those who came on the Internet and embraced it when any commercialization of the Net was not only forbidden but a horrifying idea. *Sell* things over the Net? Perish the thought!

More recently, you'd probably have heard variations on the definitions du jour of e-commerce, lots of ideas about what we'd be buying on the Web, what kinds of brick-and-mortar stores the "Web stores" would replace. And you'd have gotten a lot of clichés clustered around one basic idea, variously called "friction-free capitalism," "going to the source," or "eliminating the middleman."

There's a fine word for that process of cutting out layers of transactional fat between the maker and the ultimate buyer: *disintermediation*. In other words, doing away with many of the intermediaries who wind up, expensively, stuck in the middle of so many of our transactions.

I like the idea of disintermediation. I buy a lot of stuff on the Web, and I really like that sense, when I find it, that I'm buying close to the source.

I especially like it when the D-word results in lower prices. But often enough I find I consciously trade up on quality of experience, if down a little on getting the best price. Amazon.com, for example, rarely has the best prices on the books I'm looking for; with Buy.com selling everything at cost, Amazon.com's days of boasting the lowest prices around are over. But Amazon.com's editorial depth and especially such features as one-click ordering keep me coming back.

That kind of diversity—a range of choices from the very cheapest to an only-pretty-good price but with some extra convenience thrown in—is also, it strikes me, a result of the Web's tendency toward disintermediation.

But despite what you'll hear from some pundits, disintermediation isn't all e-commerce is about. In fact, sometime the process works just the other way.

Consider the online auction site eBay, for exam-

ple. If we can credit the almost-too-good-to-be-true story, eBay's founder, Pierre Omidyar, created the site because his girlfriend, Pam, wanted a way to add to and sell off her collection of Pez candy holders.

There was no organized way for Pez sellers to find buyers, no way to determine the real collectible worth of those clever little candy packages. What she needed—what collectors, it turned out, in many areas needed—was some *intermediation*. That is, a virtual intermediary that provided a forum for buyers and sellers to meet.

The results are history: When I looked a few minutes ago, eBay was offering 1,853,799 items for sale. And following a hugely successful IPO last fall, eBay was recently trading for \$155 per share, giving the company a market value in the neighborhood of \$20 billion—right up there with Amazon.com.

Obviously, there's something to this intermediation stuff. As useful as disintermediation can be, I suspect that over time, its opposite will be an even more important force in the growth of e-commerce: providing markets where none existed before.

There's one more twist here, and it's one I've been wrestling with a lot lately. I was a longtime user of Interloc, a Web-based service for finding out-of-print books. Booksellers all over North America listed their inventories on Interloc, and when you searched, you got a long list of hits, one for every copy of your title a participating used/antiquarian bookseller had in stock. You could browse through the listings; compare bindings, condition, and prices; then e-mail or simply call the bookseller you'd chosen, to order. Often those conversations were as satisfying as getting the book itself; antiquarian booksellers are an interesting sort.

(Yes, you can also search for and buy used and out-of-print titles through Amazon.com and barnesandnoble.com, though neither allows live, online searching for titles. Behind the scenes, Amazon.com and barnesandnoble.com submit your request to one or more of the online book-search services, such as Advanced Book Exchange (www.abebooks.com). You're then offered the book at a fat markup—and



There's a fine word for that process of cutting out layers of transactional fat between the maker and buyer: *disintermediation*.

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Jim Seymour

if you say yes, Amazon.com or barnesandnoble.com buys it for you from the dealer, charges your credit card, and ships it to you. You can skip the delays and big markups, of course, by simply doing this yourself.)

Sadly, Interloc is no more. For better or worse, a West Coast entrepreneur, Marty Manley, bought Interloc, shut it down, and replaced it with Alibris (www.alibris.com)—which at first glance is a much fancier version but in fact is not the same thing at all. Alibris actually reinserts a layer of intermediation that the Web, through Interloc (and other, similar services), had helped eliminate. Alibris customers can't deal directly with booksellers anymore; they deal with—Alibris.

Buy a book listed by an Alibris-affiliated bookseller and the company contacts the bookseller, which mails the book not to the buyer but to Alibris's warehouse in Nevada, where it's unpacked, examined, repacked, and reshipped to the buyer. Alibris tacks on a 20 percent markup for this round of intermediation.

Marty, with whom I've had some—umm—discussions about this approach, justifies the fee and double-shipping delays by saying Alibris adds a layer of certainty and protection for the book buyer against getting ripped off and brings a single, national brand to what has always been a chaotic and disorganized business. I say bunk.

Organizing the amiably disorganized is not necessarily a good deed. I've bought hundreds of books, one or two at a time, from antiquarian booksellers I found over the Net and never lost a dime.

It's hard to argue with Marty's success. Alibris's sales are soaring. And if you still like the older way, as I do, there are plenty of alternatives, most notably Advanced Book Exchange (mentioned above).

Disintermediation, intermediation, now reintermediation. Sigh: Not so long ago, e-commerce looked so simple.

Singular notions, such as "This is what e-commerce is all about," are nonsense.

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Twenty More Questions

You have just 45 minutes to change planes *and* download the 7MB of e-mail that arrived during the Philadelphia-to-Denver leg of your flight. Why can't e-mail downloads be made customizable so you get the mail you want in the order you want? You could specify: First send all messages, then get all internal e-mail less

than 256K, then get all external e-mail less than 100K, and of the remaining bigger files, first get the ones from your departmental coworkers, your boss, and your family.

Why can't Red Carpet Clubs, Crown Rooms, and Admirals Clubs have Ethernet connections so you can get all your mail in 60 seconds? And the airline-club phones could all have two lines, so you could check voice mail on line 1 and e-mail on line 2.

If Intel wants IEEE 1394 (FireWire) to succeed, why has the company put an indefinite hold ("not until after 1999") on putting it into the chip set?

If FireWire patent-holder Apple wants FireWire to succeed, why was it initially trying to charge a buck a computer (a huge amount, later reduced) in royalties?

Does one go to an Intel Developer Forum to get smarter or to get confused? At the most recent one: ATA, supposedly dying, was declared to be in favor again. DeviceBay, supposedly in favor, is now unmentionable. IEEE 1394 is now dismissed as a PC-to-consumer AV interconnect. And SCSI, in limbo, will be out of favor if and when USB 2.0 (theoretically up to 120 Mbps) gets going (supposedly in the first half of 2000).

Now that most people believe Microsoft made a fool of itself at the antitrust trial, will Microsoft resolve to be less arrogant to competitors and be better prepared for future trials, or will it lay the blame at the feet of an outside PR firm and fire it?

Why doesn't a Windows directory view automatically refresh itself when you change something?

Why can't Windows Explorer watch what directory you were checking most recently (say through Microsoft Word or PowerPoint) and, when you launch Explorer, point to that directory rather than the bowels of C:\Windows?

Why do some digital cameras ship with alkaline batteries—which last maybe 30 minutes—instead of rechargeables?

If USB is supposed to take off, why is there a grand total of just seven USB ink jet, multifunction, and laser printers available: two from HP, three from

Epson, two from Lexmark, and none from Canon?

Does anybody care about fan noise? Shouldn't more major vendors offer near-silent power-supply and cooling fans for \$50 each?

Why do the wireless, phone-line, and AC-line home networking setup wizards refuse to install if you already have an office LAN on the notebook PC you bring home from work? Why didn't vendors come up with a solution *before* shipping these products?

Why doesn't Windows have a Family-Security-for-All-Ages module that lets a 4-year-old log on by clicking on his or her picture at boot time? (And requires real passwords for a teenager to log on and for Mom and Dad to get into their finance programs?)

Why don't cable modem companies have better customer service?

Why can't stores send plain-background bills (no logos, no gray/white banding, no faux parchment look) to people who scan or just photocopy their bills and receipts? And why can't they banish light-blue ink, which doesn't scan well at all?

Why do transformers for small road-warrior accessories weigh more than the accessories themselves?

Why aren't power transformers labeled with the names of the products they're used with, rather than the names of the transformer manufacturers?

How about the Windows message "The last few times your computer went on standby, it stopped responding. Would you like to prevent your computer from going on standby in the future?" Why can't it be a bit more honest and add, "We'll do that by wiping out your suspend and resume routines"?

Why did IBM replace the volume-control knob on its newest subnotebook with a two-key (Fn-PgUp, Fn-PgDn) function that doesn't work until after the loud boot-up beep?

Once you click for help on a procedure and scroll through the explanation (say, changing from double- to single-click mousing in Windows), why can't the help system take you there? Better yet, why doesn't help just do it for you? **PC**



Why doesn't a Windows directory view automatically refresh itself when you change something?

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www.pcmag.com/opinions

What's the fun of sampling just one



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when you can score all of them?

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FULL-SERVICE PACKAGES

PG 109

Taking their cue from productivity applications, vendors have moved their tools into suites that offer antivirus programs, diagnostics, uninstallers, and more at a great price. But do they deliver on integration?

DEFEND YOUR PC

PG 111

Macro viruses, infected e-mail attachments, and malicious downloads: It's a dangerous world out there. Our tests reveal which products provide the best protection.



DEFEND YOUR NETWORK

PG 123

A desktop antivirus program is only the first line of defense. For a comprehensive strategy, your business really needs a network solution. Here are three leading contenders.

TUNE UP YOUR PC

PG 141

If you're always looking to squeeze a little more performance out of your PC, or you want to tidy up the hard disk, one of these diagnostic tools is for you.



The Complete

By
John
Morris

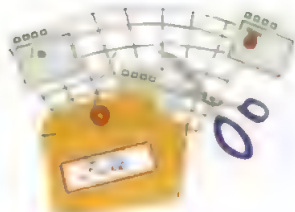
*Illustrations
by Jeff Jackson*

PC TOOL

CLIP & SAVE THE WEB

PG 169

You store interesting newspaper articles in a file folder, but what do you do with an interesting Web page? We review five products that help you store and mark up your Web research.



INSTANT MESSAGING

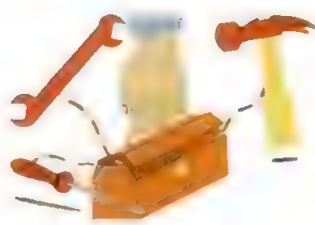
PG 171

A great way to communicate online and stay connected to breaking news and your e-mail, the best instant-messaging products are about more than just chat these days. We take a look at six of the hottest products.

DICE & DUPE DRIVES

PG 173

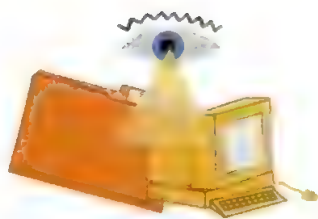
As hard disks expand, the need for utilities to manage them better grows. These tools can help you create exact images of your drives, and partition drives to squeeze more space out of them.



ESSENTIAL NT TOOLS

PG 179

Although many utilities will run on both Windows 98 and NT, others—such as disk utilities—will not. Here's a sampling of utilities designed with Windows NT Workstation in mind.



SERVICE YOUR PC ONLINE

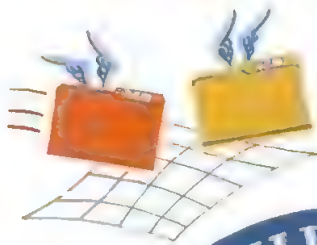
PG 156

Many of the chores typically done by software can now be performed online. These virtual service stations can scan your PC for viruses, clean up your hard disk, back up important files, and more.

GET A SAFETY (INTER)NET

PG 159

By using an online backup solution, you can ensure that your important files are not only always secure but also available from anywhere.



MAKE NET WORK, NOT PLAY

PG 160

Giving your employees Internet access can be both the best thing and the worst thing for your company's productivity. We review five products that make the Internet a tool and not a time waster.



Plus in After Hours: NET GUARDS

PG 273

Make Web surfing a safe, fun experience with these eight parental filtering programs.

Cover Story

From antivirus programs that scan as you surf to ZIP tools that work within browsers, our annual blockbuster is your definitive guide to utilities in the Internet era.

Even when a house is in "move-in" condition, it's rarely perfect from the start. There's always work to be done. Well, the same goes for a PC. Even when it's configured to your specifications, once you've "moved in"—installed your applications, peripherals, and network connections—plenty of repair and maintenance lie ahead. That's where utilities come in.

Some utilities truly are utilitarian, helping you to diagnose and troubleshoot performance problems or safeguard your computer against viruses and other digital rogues. Other utilities, such as filtering and monitoring packages, target productivity rather than performance. These are just some of the many types of tools that we review in the pages that follow.

Internet-related features have been the focus for all types of software for several years now. But as you'll see in this year's roundup, it's clear that the Internet is now having a profound influence on utilities. The most obvious sign is the emergence of a new category of online services that deliver many features traditionally provided by packaged software. Trend Micro's HouseCall, Intel AnswerExpress Support Suite, and McAfee Clinic, for example, offer services such as antivirus scanning, hard disk cleanup, and file backup online.

Although the online services are promising, there's still much work to be done if they're to compete with standalone utilities, which are themselves more Internet-aware than ever.

Our Contributors: EDWARD MENDELSON, JAN OZER, STEVE RIGNEY, and BARRY SIMON are contributing editors of *PC Magazine*. LARRY SELTZER is a frequent contributor. ALAN COHEN, DAVID HASKIN, JEREMY MOSKOWITZ, and SARAH L. ROBERTS-WITT are freelance writers. BEN Z. GOTTESMAN is a technical director, and RUSS IWANCHUK, DIANE JECKER, JAY MUNRO, and KEVIN YOUNG are project leaders at PC Magazine Labs. Staff editor MATTHEW GRAVEN and associate editors DAVID LIDSKY and JOHN MORRIS were in charge of this story.

KIT

GOING UP, GOING DOWN

PG 185

With more and more people building Web sites, having an efficient tool to manage uploading and downloading pages is essential. We review five of the latest and most popular FTP utilities that can help you get the job done.



PC EDITORS' HOT LINKS



www.pcmag.com/hotlinks

► PC Magazine Free Utilities

www.pcmag.com/downloads
Check out PC Magazine's library of downloadable utilities, including categories such as Top Ten Utilities.

► Microsoft Personal Support Center

<http://support.microsoft.com/support/>
The central site for Microsoft technical support, Support Center is easier to use than

the old Knowledge Base and includes FAQs, Troubleshooters, newsgroups, a glossary, and more.

► ICSA

www.icsa.net
The ICSA (International Computer Security Association) is an independent firm that provides testing and consulting on security issues. The organization is best known for its testing and certification of antivirus products.

► Symantec Corp.

www.symantec.com/us/index.html
One of the heavyweights in the market, Symantec develops and sells a wide range of system utilities including Norton AntiVirus and Norton Utilities. Besides product information, the site offers white papers and trial versions of many products.

► Network Associates

www.nai.com
Network Associates divides its product line into enterprise-level and desktop products, the latter sold by its McAfee Division. The site is packed with information, including white papers on how to select corporate antivirus solutions.

cases, the products are still around; they're just sold under different names. These and other companies have been bought up by Symantec Corp. and Network Associates, which are bulking up for a head-to-head battle for the desktop and enterprise utilities markets.

Consolidation is also evident in the products themselves. Symantec and Network Associates are striving to duplicate Microsoft's success with office suites in the utilities market. In this story, we review Symantec's Norton SystemWorks 2.0 and Network Associates' McAfee Office 1.06. Each contains a core group of applications (antivirus, diagnostic, and uninstall) and a long list of extras at an attractive price.

One caveat on suites: Most utilities require system resources to do their work; suites require even more. For example, Norton SystemWorks reduced performance by about 11 percent on our test systems. So if you opt for a suite instead of standalone utilities, install only the tools you really need.

Fortunately, everything you can buy in a suite can still be purchased on its own. And the bulk of our story is devoted to

For example, most of the desktop antivirus programs and network antivirus solutions we tested let you update the virus definition files and, in some cases, the virus scanning engine via the Internet. This is critical, because antivirus programs identify computer viruses by comparing

them with their databases of known viruses—and new ones appear all the time.

Another trend you'll notice is that some familiar names are missing. Companies such as CyberMedia, Quarterdeck, and Dr. Solomon's have disappeared. But in truth, the technology and, in some

WHAT'S ALREADY IN WINDOWS

Although a large number of utility products are available from third-party developers, many useful tools are already included in Microsoft Windows 98 and Windows NT to help you optimize your system's performance.

SYSTEM OPTIMIZATION

WINDOWS 98

ScanDisk checks hard disks for errors and eliminates lost hard disk clusters.

Disk Defragmenter organizes the data on hard disks to improve performance.

Disk Cleanup automatically removes unwanted files, freeing up space.

Maintenance Wizard lets you automate system optimization tasks.

DIAGNOSTICS

WINDOWS 98

Device Manager lets users diagnose problems with hardware and drivers, such as IRQ conflicts.

Automatic Skip Driver Agent searches for potential problems with drivers.

System Information collects and reports details of your system's configuration.

System Monitor tracks various aspects of a system's performance.

Resource Meter monitors the system resources that are being used by programs.

Dr. Watson detects faults in software and reports the errors (but it doesn't provide crash-protection).

Registry Checker finds and fixes problems in the Windows Registry, as well as creating backups of the Registry.

WINDOWS NT 4.0 WORKSTATION

Windows NT Diagnostics monitors system resources and provides data such as build numbers, driver information, and network usage data.

DEPLOYMENT AND MAINTENANCE

WINDOWS 98

Add/Remove Programs simplifies the process of installing or removing software.

Add New Hardware incorporates Plug and Play to automate the detection of new components and the installation of appropriate drivers.

FAT32 Conversion Utility converts existing FAT16 partitions to FAT32.

System Configuration helps users create and restore backups of configuration files.

Backup backs up hard disks to floppy disks or tape drives.

WINDOWS NT 4.0 WORKSTATION

Setup Manager lets you create installation scripts to automate client installations.

System Preparation Tool prepares hard disks for duplication, letting companies easily migrate to Windows NT Workstation.

System Difference Utility can simultaneously install additional applications along with the operating system.

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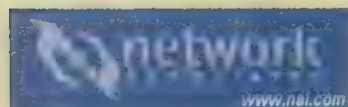
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ImageCast® IC3 is a registered trademark of Micro House Development, Inc.
Norton Ghost is a registered trademark of Symantec. Photo by John Roberts.

WHAT HAPPENED TO ALL THE UTILITY VENDORS?

If you thought merger-mania only affected banks and media companies, take a look at what's happened to the utilities market over the past year or so. The buying binge has set up a head-to-head battle between Network Associates and Symantec Corp.



It is fitting that Network Associates has expanded aggressively over the past year through acquisitions;

the company itself was the result of a merger of Network General and McAfee Associates. Since then, it has been on a shopping spree, acquiring seven other software and services companies. The result: a company that is one of the leading vendors of enterprise network security and management products, as well as of desktop utilities.



Just about anyone who's ever used a PC recognizes the bright yellow box and the image of founder Peter

Norton that graces every product in the successful Norton line. Founded in 1982, Symantec sells a wide range of software including desktop utilities (Security and Assistance unit), applications for mobile workers (Remote Productivity unit), and even HTML-authoring and Java-development tools (Internet Tools unit).

CyberMedia July 28, 1998 \$130 million

The acquisition of CyberMedia instantly expanded Network Associates' desktop product line. Key products gained in the sale include First Aid, Guard Dog, and Uninstaller—all three of which are now sold under the McAfee brand.

Dr. Solomon's Group PLC June 9, 1998 \$642 million

The U.K.-based Dr. Solomon's Group was one of the leading anti-virus vendors in Europe. Network Associates acquired Dr. Solomon's Group to incorporate its antivirus technology into Network Associates' own desktop and enterprise antivirus and security products.

Quarterdeck Corp. October 26, 1998 \$65 million

Once a heavyweight in the desktop utilities market, Quarterdeck Corp. was floundering last year when Symantec announced plans to acquire it. Although Quarterdeck had a full line of utilities, the jewel in this acquisition crown was CleanSweep, the top uninstaller.

Intel Antivirus Division September 28, 1998

Symantec bought out Intel's antivirus business and licensed the chip maker's systems-management technology to strengthen its own antivirus offerings for business. As part of the deal, Symantec supports Intel's 18,000 antivirus customers.

Helix Software Co. December 1, 1997 \$28.6 million

The acquisition of Helix Software Co., creator of utilities such as Hurricane and Nuts & Bolts, positioned Network Associates to compete directly with Symantec Corp. in the desktop utilities market.

Pretty Good Privacy December 1, 1997 \$36 million

Pretty Good Privacy was perhaps the most successful seller of Internet e-mail and file-encryption software. Network Associates incorporated PGP's technology into its PGP Total Network Security Suite. PGP is also part of the McAfee Office desktop suite.

Ghost June 24, 1998 \$27.5 million

The disk cloning market came from nowhere to become one of the hottest growth areas in 1998. At the front of this trend was Ghost, a once-shareware product that was developed by Binary Research and distributed in the U.S. by Multicast Innovative Software.

IBM AntiVirus Division May 19, 1998

Symantec licensed IBM's "immune system" neural network and artificial intelligence technology, which it plans to incorporate into its Norton AntiVirus product line. As part of the deal, Symantec also assumed IBM's 1,500 corporate antivirus accounts.

these standalone applications, which protect your system, diagnose and repair problems, speed your PC, and help you get the most out of the Internet.

In the protection category, we review antivirus and crash protection programs. Antivirus programs have expanded their repertoires to respond to new security threats. Norton AntiVirus 5.0 Deluxe and Sophos Anti-Virus for Windows 95, for example, excelled at catching and removing macro viruses from Microsoft Word and Excel documents. Some antivirus programs can also scan incoming e-mail attachments and Web downloads for viruses, and block certain Web sites based on their IP addresses.

Crash protection programs are typically bundled with diagnostic suites, such as Symantec's Norton Utilities 4.0 and Network Associates' Nuts & Bolts 98. These memory-resident applets intercept system crashes, report on what occurred,

and let you save your work.

Although filtering tools generally fall into the protection category, they also serve as productivity tools. In the corporate filtering section ("Make Net Work, Not Play") we review tools that help businesses ensure that employees are making good use of their time online. (Parental filtering tools are covered in this issue's After Hours section.)

No matter how well you insulate your system from threats, something inevitably goes wrong. Enter diagnostic programs, which address a wide range of problems including IRQ conflicts, missing shared files (DLLs), and corrupted Registries. In a separate section, "Essential NT Utilities," we test tools designed specifically for Windows NT Workstation.

In addition to troubleshooting, most diagnostic programs also include optimization tools for such chores as defragmenting your hard disk (more thoroughly than

Windows can), decompressing the Registry, and weeding out unnecessary files.

The Internet affords whole new opportunities for PC users, but to get the most out of it, you need specialized tools. In addition to the filtering programs, our Internet toolkit includes Web organizers ("Clip and Save the Web"), instant messaging clients, and FTP utilities ("Going Up, Going Down").

Though these tools sound familiar, you may be surprised to learn what they can do now. Web organizers, for instance, not only retrieve the right information from the Web but also annotate and categorize it. And instant messaging is not just for gossipy teens; features such as multiuser chat, e-mail notification, and file transfers are helping it find new niches.

As you can see, the range of PC utilities available could fill a very large toolbox. With the right selection, however, you can build and maintain your dream PC.



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getting hooked up in
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THE Computer PAGE.

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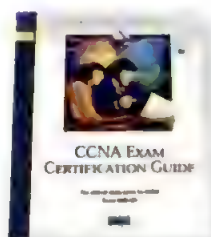
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MCSE READINESS REVIEW EXAM 70-067: MICROSOFT® WINDOWS NT® SERVER 4.0

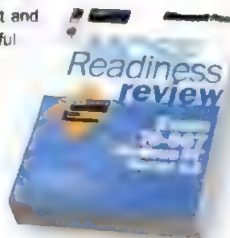
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Use proven testing tips and techniques from the engineers at Microsoft. Every objective of exam 70-067 gets complete coverage here, from implementation to configuration to trouble-shooting your NT Server 4.0. The CD-ROM is bursting with sample questions, and all responses—both right and wrong—result in helpful explanations. (Microsoft)

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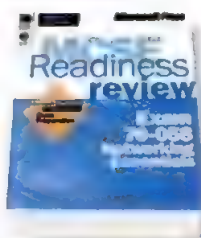
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This book and CD-ROM are designed specifically for professionals who need to determine if they are ready to take MCSE exam 70-058. After a random delivery of 60 questions drawn from the test, the assessment engine will indicate what objectives were passed and which may require further study. A vital resource to maximize your chances for success. (Microsoft)

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MCSE READINESS REVIEW EXAM 70-073: MICROSOFT® WINDOWS NT® WORKSTATION 4.0

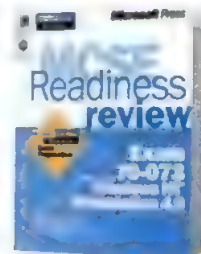
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MCSE READINESS REVIEW EXAM 70-087: MICROSOFT® INTERNET INFORMATION SERVER 4.0

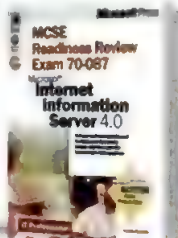
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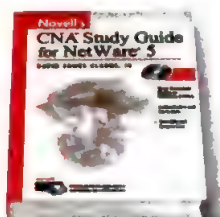
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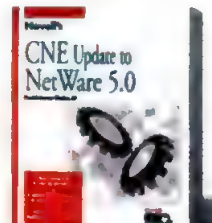
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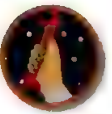
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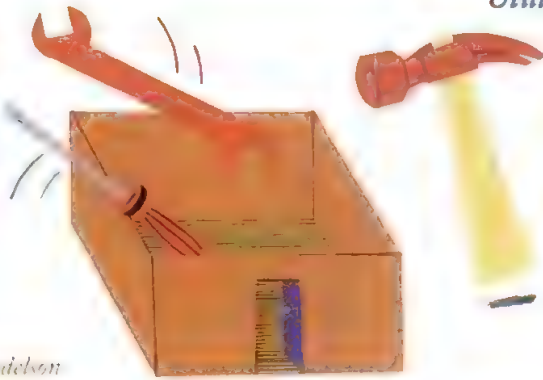
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FULL-SERVICE PACKAGES

By Edward Mendelson



The software suite is hardly a new concept, but it took some time to find its way to the utilities world. Why buy utilities in a suite? For the same reasons you buy office applications in suites. A suite costs less than separate antivirus, diagnostic, crash protection, uninstall, and other programs. And you get the benefits of integration: one install routine, one main interface, and applications that look and act the same.

Currently, the utility suites market is a two-horse race between Symantec Corp.'s Norton SystemWorks 2.0 and Network Associates' McAfee Office. Neither of these two players yet offers the level of integration found in, say, Microsoft Office 97. But Norton SystemWorks comes closest. Even if you plan to buy only two Symantec utilities (Norton AntiVirus 5.0 Deluxe and Norton Utilities 4.0, for example), you'll save \$30 with the suite and get a whole lot of extra tools thrown in. 

McAfee Office

\$99.95 list. Network Associates, Santa Clara, CA; 800-338-8754, 801-492-2700; www.mcafee.com.

● With Network Associates' McAfee Office 1.06 utility suite, integration is mostly skin deep. Despite some notable improvements in this minor upgrade, McAfee Office remains less an integrated suite than a bundle of programs developed by Network Associates, McAfee, CyberMedia, and others.

One sign that this suite hasn't quite gelled is that not all the tools are appropriate for the same types of users. First Aid

2000, Guard Dog, McAfee VirusScan, Oil Change, and UnInstaller are suitable for all levels, while Hurricane 98 and Nuts & Bolts 98 target more advanced users. And many of the tools offer duplicate features. The suite's main interface, Office Central, is merely a launcher for the individual tools.

Installation lets you choose either an Express or Custom setup. The Express option lets you select any or all ten applications. The Custom install lets you specify more precisely which components to install. The complete installation occupies 190MB of hard disk space, installs three variations of the same Discover system reporting tool, and produces two separate emergency recovery floppy disks. Each utility has to be uninstalled separately.

Several of the applications in McAfee Office are first-rate (see the following sections for complete reviews), and Network Associates has made some improvements. But aside from a lower price tag, McAfee Office offers little advantage over buying its applications separately.

Norton SystemWorks

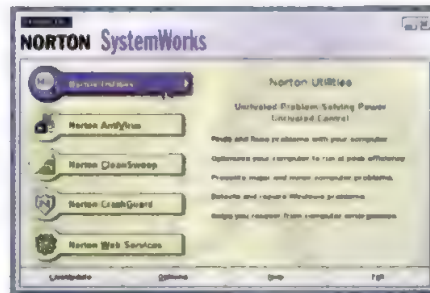
Standard Edition, \$69.95 list; Professional, \$99.95. Symantec Corp., Cupertino, CA; 800-441-7234; www.symantec.com.



Norton SystemWorks 2.0 brings together several best-of-breed utilities for significantly less than you'd pay to get them separately. But the real advantage lies in SystemWorks' integration.

In addition to Norton AntiVirus 5.0 and Norton Utilities 4.0, the Standard Edition includes Norton CleanSweep, Norton CrashGuard, and Norton Web Services. The Professional Edition adds Norton Ghost (a disk-cloning tool) and Norton 2000, which scans for Y2K glitches.

A single setup routine installs (or uninstalls) all of the main programs in one operation and lets you choose between a Typical (105MB) or Complete (122MB)



From Norton SystemWorks 2.0's main menu, you can launch the main applications or update the suite.

installation. The Complete option also adds Norton Utilities' advanced modules and activ-

ates more of the system monitors that load at start-up.

SystemWorks' main interface is a simple program launcher that includes a LiveUpdate button for updating the suite in a single step. And while the various programs are suited to both intermediate and advanced users, there is little overlap among their features (see the following sections for detailed reviews).

SystemWorks still isn't the Microsoft Office of the utilities world. But for one-stop shopping for system utilities, it's the obvious choice. 

	McAfee Office	Norton SystemWorks 2.0
Installation	Good	Excellent
Interface	Poor	Good
Application integration	Poor	Excellent
Updates	Fair	Excellent
Internet integration	Excellent	Excellent
Virus protection	Good	Excellent
Diagnostics	Good	Good
Uninstallers	Excellent	Excellent
Y2K tools	Good	Excellent
Personal data security	Excellent	Good
Other software	Poor	Excellent
Technical support	Good	Good



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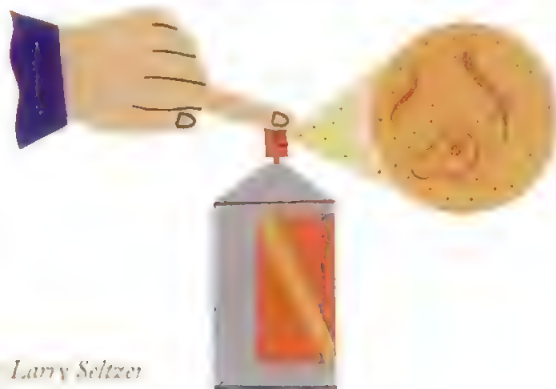


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DEFEND YOUR PC

By Larry Seltzer



Good antivirus programs are like insurance policies. You can go for years without ever needing one, but when the time comes, you'll be glad you have it.

Over the past few years, two major developments have greatly increased the odds that you'll come across a computer virus: the Internet and the rise of a new form of viruses called macro viruses. From a security standpoint, the Internet represents a double threat. First, the Internet has introduced new ways of writing viruses and other malicious programs using technologies such as ActiveX controls and Java applets. Second, the Internet makes it vastly easier for viruses to spread via e-mail and downloads. These methods of transferring viruses have played a big role in the sudden rise of macro viruses (a macro is a mini-application that resides within a Microsoft Word or Excel document).

An antivirus program scans drives, folders, or files to identify viruses. If it detects one, the program can delete the infected file or attempt to remove the virus while leaving the file untouched. But what makes antivirus software so critical is that it sits in the background monitoring your system for any viruslike activity—a feature you should always enable. Finally, remember that an antivirus program is only as good as its last update. To get complete protection, you must regularly update the virus definition files and the scanning engine. By following these steps, you can be sure that your system will be ready when that day finally comes. ☐

Command AntiVirus

\$40 street. Includes 90 days of program updates, one year of updates to virus definition files. Command Software Systems Inc., Jupiter, FL; 800-423-9147; www.commandcom.com.

● A multiplatform product (for Windows 95, 98, NT, and 3.1; DOS; NetWare; and IBM OS/2 Warp) that supports network features such as centralized logging and software distribution, Command Software's Command AntiVirus (formerly F-Prot Professional) may appeal to administrators who work with mixed environments. The Windows 98 version we tested, however, produced uneven results.

Command AntiVirus's main interface is straightforward. You simply select the drive, folder, or file that you want to scan.

The program successfully disinfected all our test documents and left our end-user

macros in all but one. But Command AntiVirus also generated some false positives. Data Fellows' F-Secure Anti-Virus for Windows 95, which shares F-Prot's HoloCheck scanning technology, generated the same error. The problem was quickly fixed by Command Software, but it gave us cause for concern about the heuristics algorithms used in the F-Prot engine.

On our ZD Winstone 99 performance tests, when Command AntiVirus's Active Protection resident scanner was loaded, the system suffered an 8 percent performance hit, compared with approximately 3 to 4 percent for most competitors.

Command AntiVirus is one of only a few products we tested that supports incremental updates, so you don't need to download the entire virus definition file each time you update the program. However, Command AntiVirus offers no way

to schedule automatic updates. Also, Command AntiVirus reminds you that your virus definition file is old only when you actually launch the scanning program.

There's a lot of value and quality in Command AntiVirus, but Command Software needs to do some work to keep up with the competition.

eSafe Protect for Windows 95

\$49 download, \$70 street. Includes one year of virus definition updates. Aladdin Knowledge Systems, Seattle; 888-772-3372, 206-524-9159; www.esafe.com.

● Although Aladdin Knowledge System's eSafe Protect for Windows 95 includes a full antivirus system, the real focus of the product is on malicious software that you might encounter on the Internet. For now, most of these Internet threats are more theoretical than real. As a general antivirus program, eSafe has some room for improvement.

To guard against potentially malicious ActiveX controls, Java applets, and even JavaScript, eSafe Protect runs programs in a secure area of memory where it can monitor their actions safely.

When dealing with the more conventional, real-world viruses on our tests, eSafe was not completely successful. It cleaned out every virus from our test documents but stumbled when disinfecting Groov.B, a macro virus. The content of the document was undamaged, but we couldn't examine the macro without getting Word error messages. eSafe also removed all macros, including user macros, from two documents.

Like most antivirus products, eSafe runs on autopilot after you install and configure it. Should you enter the program, you'll find it looks more like a video game than a Windows utility. The program gives you extensive control over the scanning process, but it took us some time to figure

out all of the dialog boxes required to control these powerful options. The documentation won't help much either—our program came with a manual for Version 1.0. Updated information is in separate PDF files.

Virus definition updates in eSafe could also use some work. Unlike other products, eSafe provided no warning that our virus definition file was out of date after we set the system clock ahead six months. But you can schedule automatic updates.

An ambitious product, eSafe Protect for Windows 95 tries to do a lot. But it still needs to get the basics of antivirus protection right.

F-Secure Anti-Virus for Windows 95

\$39 download. Includes program upgrades and virus definition updates for the life of the version (about one year). Data Fellows, San Jose, CA; 888-432-8233, 408-938-6700; www.datafellows.com.

● Data Fellows' F-Secure Anti-Virus for Windows 95 can work for individual users, but the company's primary focus is on network-based administration. The product provides scanning engines for numerous platforms, including Windows

95, 98, NT, and 3.1; DOS; Mac OS; and IBM OS/2 Warp, and supports features such as centralized administration. We tested the single-user, Windows 95 and 98 versions, which, in this scenario, we found to be lacking.

F-Secure is the only product we tested that lets the user choose from multiple scanning engines. But the use of two engines did not seem to slow down the system unduly on our ZD Winstone 99 performance tests. On our disinfection tests, F-Secure removed all the viruses completely, but it also removed all end-user macros in four of the ten test documents. And the F-Prot engine, which is also found in Command AntiVirus, generated a false positive on several Microsoft Word documents.

Data Fellows offers daily updates of its virus definition files. While this may be overkill, you'll at least be reasonably sure that F-Secure is prepared for even the most recent viruses. Unfortunately, F-Secure does not let you schedule automatic updates.

The user interface for F-Secure is adequate but not the most modern or flexible. Oddly, when you set up a manual virus scan, double-clicking on a task brings up

its properties rather than executing it—a nonstandard approach that we never quite got used to. One of the program's strengths is that it also has a command line interface, which is useful when running F-Secure with a third-party scheduling applet or in DOS from a boot disk.

In a networked environment, F-Secure would have more to offer, but single users have better alternatives.

McAfee VirusScan

\$50 street. Includes virus definition updates, 90 days of program updates. Network Associates Inc., Santa Clara, CA; 408-988-3832; www.mcafee.com.

● The latest version of Network Associates' McAfee VirusScan combines technology from several products: the original McAfee product, the former Dr. Solomon's Anti-Virus Toolkit, and McAfee WebScan X. On the whole, VirusScan performed well in testing, but we were disappointed by some flaws in the product.

VirusScan can scan for almost any type of malicious code, including all downloads, ActiveX controls, and Java applets. It is also one of the few products here that can scan e-mail attachments as they arrive (other products wait until you detach a

HOW A COMPUTER VIRUS IS CAUGHT

A virus is a computer program that piggybacks on other program files, overwrites the boot sector on a floppy disk or hard disk with infected code, or

attaches itself as a macro to a Microsoft Word or Excel file. A virus is activated when the program it is attached to is launched. Like real viruses, computer

viruses replicate themselves, spreading to other computer systems. Some viruses are simply nuisances; others can actually destroy data.

Scanning

Because new viruses are constantly emerging, antivirus programs use a variety of strategies to identify them. Some major ones include:

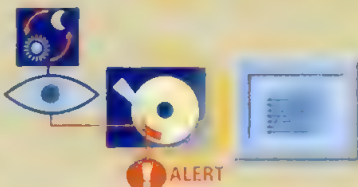
1. Signature scanning

The antivirus program scans the files on your system and compares them with files in a library of known viruses (a virus definition file). You can select the types of files to scan, their locations, and when you want the scan to occur



2. Real-time protection

To protect your system at all times, the antivirus program includes a memory-resident applet that sits in the background and watches for viruslike behavior or code that matches a virus signature.



3. Heuristics

A new virus may not have a telltale signature already recognized by the antivirus program. To spot such viruses, the antivirus program uses rules or algorithms that identify suspicious-looking programs.

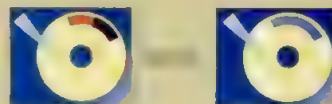


Cleaning

When an antivirus program detects a virus, you have several options.

1. Delete the infected file

In network environments, many administrators configure client PCs simply to delete the file rather than risk spreading the virus to other parts of the network.



2. Clean it

Most files can be disinfected or cleaned of the virus code without having the rest of their content destroyed. This is a good solution for macro viruses, because it saves the Word or Excel documents.



3. Quarantine it

This technique is often used with files that may contain polymorphic viruses. The program places each file in a safe location, executes it, and watches what happens to determine whether it contains a virus.



4. Send it to the vendor

Some antivirus programs also let you submit suspicious files to their virus labs. If a file is infected, your vendor's lab posts an update containing a signature for that new virus.



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file), protecting you from accidentally forwarding an infected file to others. The performance impact from this resident scanning was an unnoticeable 4 percent.

VirusScan now incorporates a Web content filter that can block Web sites based on IP address or site name (Trend Micro's PC-cillin 6 also has this feature). It's not a full "dirty-word blocker," but it gets you part of the way there (for more information, see the stories on corporate and parental filtering programs in this issue). VirusScan also comes with a very flexible scheduler.

VirusScan performed almost perfectly when disinfecting our test documents. It did disinfect all of them, but to remove the CAP.A virus, it had to remove end-user macros.

VirusScan comes with a version of BackWeb, which is designed to push virus definition updates to your desktop. But during our tests, the Web address for the BackWeb updates was inactive, and we were never able to get the feature to work. In effect, that means VirusScan lacks the ability to execute updates of virus definition files automatically, based on a schedule—a serious deficiency.

McAfee VirusScan is a highly capable product with a breadth of features not found in most antivirus programs. Only some miscues on macro tests and a poorly implemented push feature hold it back.

Norman Virus Control for Windows 95

\$50 street. Includes one year of program updates and virus definition updates. Norman Data Defense Systems Inc., Fairfax, VA; 888-466-6762, 703-267-6109; www.norman.com/us.

● Though it lacks the name recognition of some of the other programs reviewed here, Norman Virus Control for Windows 95 has many notable features that

EDITORS' CHOICE

Norton AntiVirus 5.0 Deluxe



Winning our Editors' Choice designation is getting to be a habit for Symantec Corp.'s Norton AntiVirus 5.0 Deluxe. And with good reason.

Despite lots of competition, Norton AntiVirus continues to deliver the most effective virus protection in an easy-to-use package.

Like all the products in our roundup, Norton AntiVirus is certified by the ICSA to provide protection against nearly all known viruses. More important, on our tests, it was one of only three products to remove all ten test macro viruses safely in full, without

touching user macros. To keep up with the latest viruses, you can use Symantec's excellent LiveUpdate feature.

The program's interface is so simple that no training time is needed. Just about everything you need is accessible by clicking on one of the program's large buttons. And we especially liked that Norton AntiVirus uses Microsoft Windows 98's Scheduled Tasks feature rather than adding its own scheduler.

may appeal to advanced users. However, Norman's interface is more complicated than most of the other products, and on occasion it removed all macros from Microsoft Word.

Norman has two primary ways of catching viruses: Cat's Claw for resident pattern scanning and Smart Behavior Blocker which uses heuristics. Smart Behavior Blocker has a number of scanning features that few other programs offer. You can include or exclude specific files, create a separate list of files to scan in the background based on their file extensions, and exclude specific strings when scanning boot sectors and memory.

Cat's Claw has some interesting features that allow precise definition of your protection level. For instance, you can certify specific macros as accepted in the environment and treat all others as suspicious.

While these features are useful to developers and administrators, ordinary users will probably have little need for them.

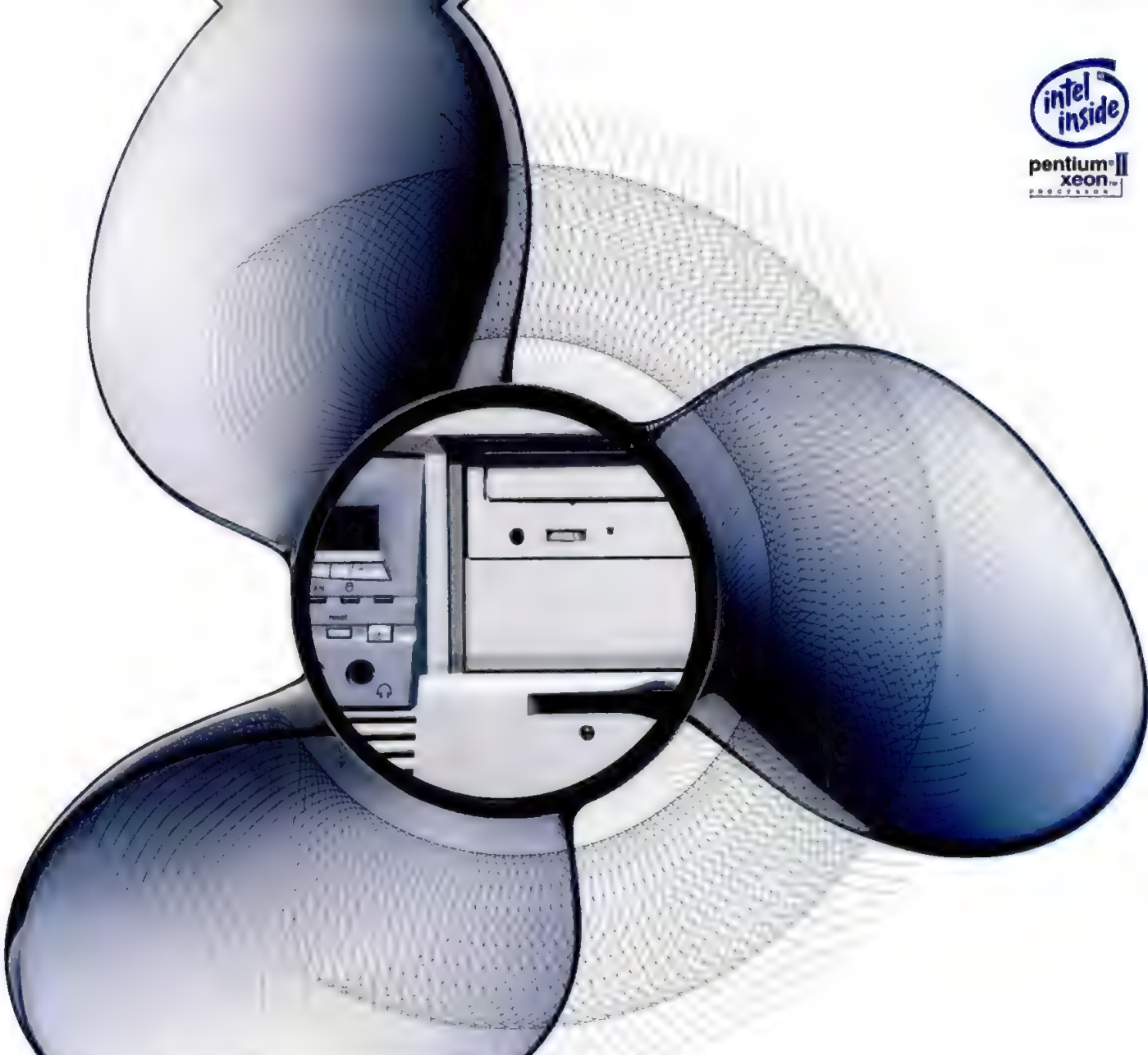
In addition, these power settings only add more confusion to an already complex interface. Part of the problem is that Norman's interface is drive-oriented rather than task-oriented. The program also employs *styles*, which are saved sets of configuration parameters, but these are not clearly explained, and it took us some time to get the hang of them.

By contrast, you can easily obtain virus updates via Norman's Web or FTP sites, although the product neither supports incremental updates nor includes a scheduler.

Advanced users who want complete control over virus protection will like this product. Others are better off with a simpler approach, such as Symantec's Norton AntiVirus.

	Command AntiVirus	eSafe Protect for Windows 95	F-Secure AntiVirus for Windows 95	McAfee VirusScan	Norman Virus Control for Windows 95	Editors' Choice Norton AntiVirus 5.0 Deluxe	Panda AntiVirus 6.0 Platinum	PC-cillin 6	Sophos AntiVirus for Windows 95
Installation	Good	Good	Good	Fair	Good	Good	Excellent	Good	Good
Configuration	Good	Fair	Good	Excellent	Fair	Excellent	Excellent	Excellent	Good
Scanning	Fair	Good	Fair	Excellent	Good	Excellent	Good	Excellent	Excellent
Disinfection	Good	Fair	Fair	Good	Good	Excellent	Fair	Good	Excellent
Updates	Good	Fair	Fair	Fair	Good	Excellent	Excellent	Excellent	Fair
Scheduling	Good	Good	Good	Good	Good	Excellent	Good	Excellent	Fair
Internet features	N/A	Excellent	N/A	Excellent	N/A	Excellent	Excellent	Excellent	N/A

N/A—Not applicable. The product does not have this feature.



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PERFORMANCE TESTS

Antivirus Software



With the rapid growth of the Internet and e-mail, new viruses can appear in the "wild" virtually overnight. So it's critical that an antivirus program detect viruses both in the wild and in the "zoo" of all known viruses.

All of the products in our review have passed the International Computer Security Association's (ICSA's) Antivirus Product certification test. To pass the test, a product's on-demand scanner must detect all of the viruses in the wild and 90 percent of the other viruses in the ICSA virus collection without producing false positives. (A false positive is when an antivirus program reports that a clean file is infected.) In addition, the product's *on-access module*, the memory-resident portion that sits in the background watching for potential viruses, must detect all the viruses in the wild and 90 percent of the other macro viruses in the ICSA's collection again without producing false positives.

It's important that you be able to clean infected word processing documents and spreadsheets without losing work. To gauge how well these products disinfect files, we created, scanned, and cleaned

ten Microsoft Word and Excel documents, each containing one of ten different macro viruses. Ideally, an antivirus program will remove the offending macros while leaving the file's contents and any valid macros intact. Some programs remove certain viruses by deleting the document's entire macro table, a less-than-ideal solution because it kills all good macros along with the bad. Only one product, Aladdin Knowledge Systems' eSafe Protect for Windows 95, damaged a file when disinfecting a macro virus, in this case a virus called Groov.B.

We also tested these programs' scanning performance by measuring the time they took to scan a drive containing 1,593 files of different types using each program's default settings. Since the programs scan different file types by default, we also reported the total number of files scanned and the rate of scanning in files per second. Sophos Anti-Virus for Windows 95 is the only product in our review that doesn't scan ZIP files.

To defend against viruses and avoid spreading viruses to other computers, you must keep your program's on-access scanner active at all times. To measure the performance penalty of running the on-access scanner, we ran ZD Winstone 99 on a clean system to obtain a baseline score, installed the antivirus program, and activated the on-access scanner, then reran Winstone 99. We were pleased to see that none of the products slowed the system by more than 8 percent.

Finally, we ran a quick test to determine whether the antivirus program checks the floppy disk drive on shutdown. This is important because boot-sector viruses often spread when users accidentally boot their systems from infected disks inadvertently left in the disk drive. Only two programs, eSafe and Norman Virus Control, failed to check the drive.—Analysis written by Ben Z. Gottesman

PERFORMANCE TESTS

▼ Low scores are best.

Build type denotes first place.

denotes Editors' Choice

	Scan Program Files			Scan Compressed Files		Performance Degradation ▼
	Seconds	Files	Files per second	Files per second	Files per second	
Command AntiVirus	14.8	1,599	108.0	30.5	52.4	8%
eSafe Protect for Windows 95	19.9	1,316	66.1	20.1	79.1	4%
F-Secure Anti-Virus for Windows 95	45.3	1,342	29.6	3.1	516.5	3%
McAfee VirusScan	22.7	1,621	71.4	27.7	57.7	4%
Norman Virus Control for Windows 95	19.5	1,631	83.6	8.6	182.6	1%
Norton AntiVirus 5.0 Deluxe	35.7	1,610	45.1	17.6	90.3	6%
Panda AntiVirus 6.0 Platinum	27.4	1,600	58.4	16.9	94.7	6%
PC-cillin 6.0	16.0	1,307	81.7	10.2	156.9	3%
Sophos Anti-Virus for Windows 95	35.7	1,622	45.4	N/A	N/A	4%

N/A—Not applicable. This product does not scan compressed files.

▼ Two products, Norton AntiVirus 5.0 Deluxe and Sophos Anti-Virus for Windows 95, were flawless on our macro virus disinfection tests.

Trend's PC-cillin 6.0 was nearly perfect, but it left benign fragments of two viruses, WM.Class.D and WM.Groov.B, in the documents. All other products removed legitimate macros when cleaning one or more viruses. One product, eSafe Protect, destroyed a file while attempting to remove one of the viruses.

▲ The quickest scan belongs to Command AntiVirus, which reached a rate of 108.0 files per second when scanning program files. The next closest competitor, Norman Virus Control for Windows 95, posted a rate of 83.6 files per second. When scanning compressed files, Command AntiVirus was again the fastest, but oddly Norman was among the slowest scanners. The laggard on both tests was F-Secure Anti-Virus for Windows 95. Command AntiVirus may be a peak performer, but it also takes the largest toll on system performance (8 percent) followed by Norton AntiVirus 5.0 Deluxe and Panda AntiVirus 6.0 Platinum.

MACRO VIRUS TESTS

	Overall score	Comments
denotes Editors' Choice		
Norton AntiVirus 5.0 Deluxe	10	Successfully removed all 10 macro viruses and left legitimate macros intact.
PC-cillin 6.0	10	Successfully removed all 10 macro viruses and left legitimate macros intact. Left benign remnants of virus in documents infected by Class.D and Groov.B viruses.
Sophos Anti-Virus for Windows 95	10	Successfully removed all 10 macro viruses and left legitimate macros intact.
Command AntiVirus	9	Removed all macros including legitimate ones when cleaning a document infected with the CAP.A virus.
McAfee VirusScan	9	Removed all macros including legitimate ones when cleaning a document infected with the CAP.A virus.
eSafe Protect for Windows 95	7	Removed all macros including legitimate ones when cleaning documents infected with Appder.A and CAP.A viruses. A document infected with Groov.B was not functional after disinfection.
F-Secure Anti-Virus for Windows 95	6	Removed all macros including legitimate ones when cleaning documents infected with Appder.A, CAP.A, Class.D, and Groov.B viruses.
Norman Virus Control for Windows 95	6	Removed all macros including legitimate ones when cleaning documents infected with Appder.A, CAP.A, Class.D, and Groov.B viruses.
Panda AntiVirus 6.0 Platinum	6	Removed all macros including legitimate ones when cleaning documents infected with Appder.A, Class.D, Groov.B, and Laroux.A viruses.



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Norton AntiVirus Deluxe

\$50 street. Includes one year of virus definition updates. Symantec Corp., Cupertino, CA; 800-441-7234; www.symantec.com.

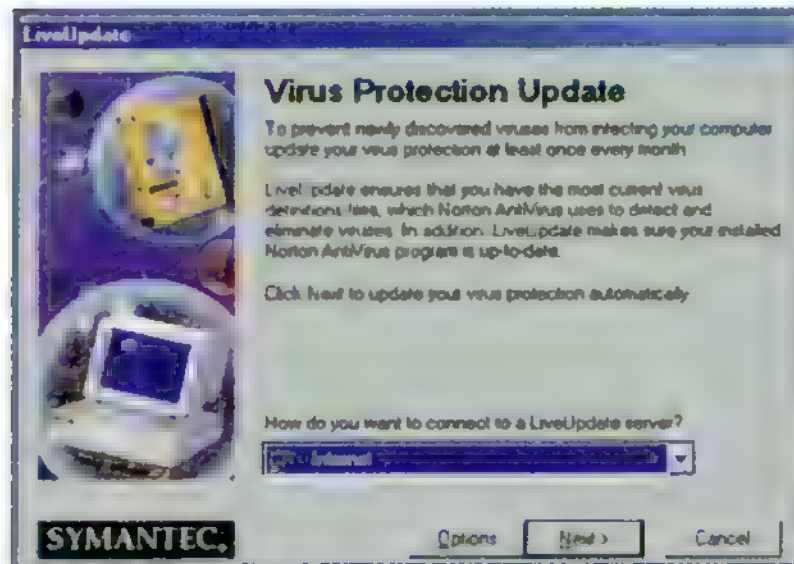


From the accessible user interface to the thorough scanning and disinfecting, the work that went into Symantec's Norton AntiVirus 5.0 Deluxe is evident. One of the easiest programs to use in this roundup, Norton AntiVirus is also highly effective. Norton AntiVirus was one of only three products to disinfect every virus on our tests completely, without removing user macros.

Norton AntiVirus has a number of useful features found in few if any of the other

products. If you can't easily disinfect a file, you can use the quarantine feature to save it in a safe directory. You can then submit the file to Symantec's Antivirus Research Center, which will disinfect the file.

To download new virus definition files or program updates, you use LiveUpdate, a one-button update facility that sets the standard for usability in this category. Conveniently, LiveUpdate supports incremental updates so you only need to download the new virus definition files. The interface is basic: Almost everything you need to do can be accomplished by pressing a prominently displayed button. However, we'd like the ability to save a task that scans a particular folder or set of folders. Such tasks can be set in the scheduling interface but not in the normal scanning screen.



To keep up to date, LiveUpdate downloads programs and virus definition updates.

On Windows 98, Norton AntiVirus uses the new Windows Scheduled Tasks facility to schedule scans and virus updates. Scheduled Tasks is a powerful facility, and Symantec was wise to use it instead of adding its own scheduler.

In our initial testing, we discovered that Norton AntiVirus was

exactingly an unusually heavy toll on system performance. Symantec released a patch (available via LiveUpdate) that reduced the performance penalty from 14 percent to about 5 percent.

On the whole, Norton AntiVirus deserves its fame. Symantec has made it easy to use and thorough in its protection. Users will be well served by this package.

Panda Antivirus Platinum

\$49 list. Includes lifetime program updates and virus definition updates. Panda Software International, San Francisco; 800-304-2030; www.pandasoftware.com.

● Panda Antivirus 6.0 Platinum is a relative newcomer to the U.S. market, so we weren't sure what to expect. We found that Panda is a promising new entry with a well-designed interface and cutting-edge Internet protection features. But the program struggled on our macro virus disinfection tests, indicating that Panda Software is not quite ready to take on heavyweights such as Symantec Corp. and Trend Micro.

Panda Antivirus's interface is one of the easiest to use in this roundup. Although it behaves much like a browser, you can customize the appearance extensively. Like Data Fellows, Panda Software offers daily updates, and the program's one-button

A NEW ANTIVIRUS ALTERNATIVE

The primary way most antivirus programs catch viruses is by comparing files on your system to a database in which are bit patterns—the fingerprints of viruses—of known viruses. Computers excel at pattern matching, so this basic approach works quite well so long as the database, called the *virus definition file*, is kept up to date.

A new product, Tegam International's **In-Defense** (\$79 download, \$60 street), takes a different approach. It tries to detect viruses by looking for telltale signs of virus behavior. In theory, this does away with the need for virus definition files. In practice, In-Defense doesn't work all that well.

One of the dangers of a program that looks for viruslike behavior is that it produces a lot of false positives. By nature, In-Defense seems suspicious of all macros, especially automatic macros. We used it to scan hundreds of Word documents and it warned of automatic macros in many of them. If In-Defense detects a virus, you can either remove it or allow it to remain.

Once you "allow" a macro, In-Defense treats it like any other legitimate user macro. On our tests, we allowed the

macros in one Word document infected with the Groov.B virus, and In-Defense stood by as we used it to infect other documents. Other antivirus programs would send up a red flag because they can recognize Groov.B.

If you take In-Defense up on its offer to eliminate automatic macros, you must eliminate all of them; the program can't disinfect individual macros. At the same time, it will remove all of Word's AutoText macros, which are not viruses but simple shortcuts for common phrases such as "Dear Sir or Madam." This seems like throwing out the baby with the bathwater to us. In-Defense is not certified by the ICSA, nor has it been submitted for certification, according to the testing organization.

The concept behind In-Defense is laudable; we'd all welcome an antivirus program that never needed updating. But PCs still aren't smart enough to recognize computer viruses accurately without a cheat sheet. We recommend you stick with the tried-and-true approach. (Tegam International, Santa Cruz, CA; 877-472-3372; www.indefense.com.)—Larry Seltzer



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Intelligent Update rivals Norton's Live-Update in ease of use: It lets you update the Virus Signature Database and the program either manually or in the background using the scheduling feature. The updates work with all versions of Panda.

Panda Antivirus has the most flexible Internet blocking we saw in testing. The Internet Protection Module scans incoming data at the Winsock layer and can therefore catch downloads from the Web, FTP sites, e-mail, and Usenet newsgroups. This feature can also block sites by port and name or IP address.

In view of all these great features, we had high hopes for Panda Antivirus, but its performance was disappointing. The program failed to disinfect four of our ten test documents and was the only product we tested that blew away all macros when attempting to disinfect a Microsoft Excel spreadsheet. Furthermore, the product was originally designed in Spanish, and it still contains some messages, dialog boxes, and help items in Spanish.

Despite its shortcomings, Panda Antivirus is an innovative product and one to watch in coming years.

PC-cillin

\$29.95 download, \$40 street. Includes virus definition updates for the life of the version. Trend Micro Inc., Cupertino, CA; 800-856-5443; www.antivirus.com.

●Trend Micro injects a lot of power into PC-cillin 6, which it markets at an attractive price. Excelling at all the most important aspects of virus protection, PC-cillin also offers Internet features competitive with the rest of the products here.

There isn't a single screen for program settings in PC-cillin, but this doesn't matter: All relevant settings can be made when using the wizard that sets up a virus scan. The scheduler is very easy to use and lets you automate virus definition updates

Sophos Anti-Virus offers good protection but is difficult to use.

as well as virus scanning.

Besides virus scanning, PC-cillin has several Internet protection features, including site blocking and the ability to scan for malicious downloads, ActiveX controls, and Java applets. But PC-cillin can't scan e-mail attachments as they arrive.

On our tests, PC-cillin was one of only three products to disinfect all ten test documents successfully while leaving legitimate user macros intact. But we discovered a glitch on two tests with Word 97 documents. In these cases, PC-cillin removed the actual viruses but left macro entries in the document with blank names.

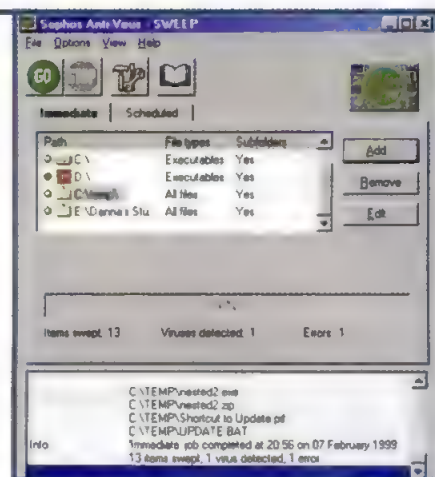
The manual is a scant 16-page overview. Fortunately, the product is so transparent that this shouldn't be a problem for most users. The help system is also less than perfect, with no context-sensitive assistance. Furthermore, PC-cillin relies on a Microsoft Internet Explorer 4.0 Active Desktop Channel to deliver virus information to the desktop. Not only did it not work well, but Active Channels have proved so unpopular that even Microsoft is abandoning them.

Trend Micro should put its efforts into better documentation rather than gimmicks such as Active Channel. But all things considered, PC-cillin 6 is a lot of program for the money.

Sophos Anti-Virus for Windows 95

Single-user license, \$99 per year. Includes monthly program updates. Sophos Inc., Woburn, MA; 888-767-4679, 781-932-0222; www.sophos.com.

●Like a James Joyce novel, Sophos Anti-Virus for Windows 95 isn't easy, but it has its rewards. Advanced users and those with heterogeneous environments will appreci-



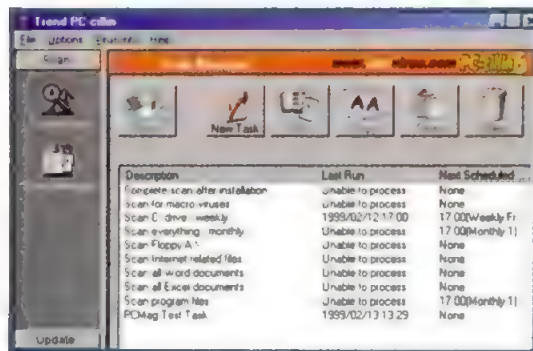
example, Sophos Anti-Virus can exclude certain files from scans, but it won't let you browse to find them, and it accepts only specific filenames rather than directories or wildcards (*.doc, for example). The method for configuring the powerful memory-resident scanner is even more difficult, requiring you to edit an obscure configuration file.

Aside from Norton AntiVirus and PC-cillin, Sophos Anti-Virus was the only product that cleanly disinfects all of our test documents without removing any user macros. Sophos Anti-Virus also has a surprisingly small footprint, requiring just 3MB of hard disk space, and the most extensive cross-platform support of any product in this story.

No antivirus product can do its job effectively if it is not up to date, and in this area we found Sophos Anti-Virus lacking. The product is sold on an annual subscription basis. Instead of virus definition files, Sophos provides monthly program updates. Every 30 days you must completely reinstall the program, and after one year you must buy another year's subscription for \$99 to keep it up to date. To deal with new virus threats, Sophos creates interim virus descriptions, but these are not easily installed. The product doesn't let you schedule automatic updates.

Unfortunately, Sophos Anti-Virus cannot scan files in compressed archives until they are decompressed. Although compressed files can't cause damage until decompressed, you may unknowingly pass infected files in archives to others.

Sophos Anti-Virus for Windows 95 is a powerful product that offers excellent virus protection. But it's not for everyone. **PC**



Trend PC-cillin's interface employs wizards for common tasks.

ate Sophos Anti-Virus. Others will be better off with a simpler and less expensive solution.

Most of the basic features of Sophos Anti-Virus are easy enough to work with, but the program lacks the ease of use offered by Symantec's Norton AntiVirus and Trend Micro's PC-cillin 6. For

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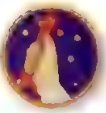
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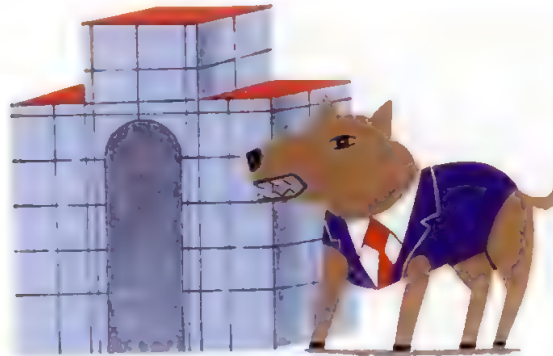
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DEFEND YOUR NETWORK

By Steve Rigney



In a perfect world, a desktop antivirus package would be all you'd need to keep your business safe from computer viruses. If end users kept their virus definition files and scanning engines up to date, most viruses would be caught before they ever caused much damage. Unfortunately, network administrators can't rely on end users alone to protect valuable data. A network is made of many parts, and each must be protected from the ever-encroaching binary intruders known as viruses and Trojan horses. We review three families of antivirus products that protect every major network component, including the file servers, e-mail servers, and client PCs.

The three solutions we tested are Trend Micro's NeaTSuite, Symantec Corp.'s Norton AntiVirus 5.0, and Network Associates' Total Virus Defense Enterprise 4.0. All three include antivirus products for Windows NT, NetWare, Microsoft Exchange, and Lotus Notes, as well as administrative tools. They also offer firewall protection, which we discuss in "Detecting Internet-Borne Viruses."

All of the products are certified by the International Computer Security Association (ICSA), meaning that they can detect all of the viruses known to be "in the wild." In addition, all of them offer the same basic scanning features and options for handling viruses once detected. As a result, when you're choosing a network antivirus solution, virus detection is less a factor than mechanisms for keeping virus definition files up to date, management across multiple platforms, and the product's impact on your network performance. With the right management features, a network antivirus solution can help you plug every hole in the enterprise. 

NeaTSuite

25 users, \$1,145 list; 500 users, \$1,680. Trend Micro Inc., Cupertino, CA; 800-228-5651, 408-257-1500; www.antivirus.com.



Symantec Corp. and Network Associates got their start with desktop antivirus products, but Trend Micro has largely focused on its server solutions and has only recently begun promoting its own desktop product, PC-cillin. Perhaps this explains why the products in Trend Micro's NeaTSuite can communicate so effectively and offer the best centralized management.

The Trend Micro NeaTSuite family includes Trend ServerProtect for NetWare

and Windows NT, and Trend ScanMail for Lotus Notes and Microsoft Exchange. The line includes two management utilities: Trend Virus Control System (Trend VCS) for servers and OfficeScan Corporate Edition (OSCE) for clients. Pricing for the suite ranges from \$1,145 for 25 users (\$45.80 per seat) to \$1,680 for 500 users (\$33.60 per seat). NeaTSuite also includes versions for cc: Mail and SMTP mail.

At the top of the Trend management pile is Trend VCS. This Windows NT-based utility lets you automatically detect

every Trend Micro antivirus server product as well as competitive antivirus products. After the products are discovered, you can group them based on location, products, domains, and even individual servers. All of this information is gathered in real time so you can immediately see if there is a problem with a particular server.

In addition to monitoring the servers, you can also use Trend VCS to configure the server's scanning options and deploy new virus definition files. All this information can be stored in the proprietary NeaTSuite database or linked to an existing LDAP directory server.

Designed to manage and control the network clients, OSCE lets you use a standard Web browser to deploy virus definitions, set scanning policies, and control the user's ability to make changes to the software. OSCE offers several methods for deploying virus definitions to the clients. For example, on our test we created a Windows NT-based log-on script that automatically updated each client when it connected to the server.

In addition to deploying new virus definition files, Trend VCS and OSCE can deploy new virus engines without requiring a new installation or reboot.

All the basic virus scanning methods are here (real-time, on-demand, and scheduled). If the program detects a virus,

	NeaTSuite	Norton AntiVirus 5.0 for NetWare/NT, Norton AntiVirus 5.0 for Exchange/Notes	Total Virus Defense Enterprise 4.0
Installation	Good	Good	Fair
Configuration	Excellent	Excellent	Fair
Management	Excellent	Good	Good
Scanning and disinfection	Good	Excellent	Good
Updates	Excellent	Excellent	Good
Scheduling	Excellent	Good	Good
Notification and logging	Excellent	Good	Good

it can delete the file, disinfect the file, or notify the administrator. In the case of polymorphic viruses, NeaTSuite sends the file to a "safe location" where NeaTSuite can open, inspect, and attempt to clean it.

A unique feature of the products reviewed here, Outbreak Alert lets administrators set specific parameters as to when they want to be notified of virus incidents. For example, we configured Outbreak to send an alert only if more than 30 viruses were detected within a few days. Outbreak Alert can notify the administrator via e-mail, pager, or SNMP alert.

NeaTSuite's centralized reporting features are the best in this group. Scanning, detection, and alerting information is sent to a centralized database that can be searched for all kinds of information, such as what percentage of virus attacks are macro viruses or what department reported the most viruses.

With an array of administrative and reporting tools, Trend Micro's NeaTSuite is the antivirus solution for control freaks.

Norton AntiVirus for Windows NT/NetWare, Norton AntiVirus for Exchange/Notes

Windows NT or NetWare version with 10 clients, \$499.96; Exchange or Notes version with 25 clients, \$795. Symantec Corp., Cupertino, CA; 800-441-7234, 408-253-9600; www.symantec.com.

● Symantec is perhaps best known for its Windows 95/98 client software, but the Norton AntiVirus family actually includes

EDITORS' CHOICE

• NeaTSuite



for installing, configuring, and updating antivirus software on both servers and client PCs—earning it our Editors' Choice.

NeaTSuite includes Trend ServerProtect for NetWare and Windows NT, Trend ScanMail for Lotus Notes and Microsoft Exchange, and two management tools: Trend Virus Control System (Trend VCS) for servers and OfficeScan Corporate Edition

A network antivirus solution is all about control. Trend Micro's NeaTSuite gives administrators the most powerful and convenient management tools

(OSCE) for clients.

Trend VCS can automatically locate any servers on your LAN or WAN that are running antivirus programs. You can then use Trend VCS to configure the scanning options and upload new virus definition files.

Other notable management tools include Outbreak—which lets the administrator set specific rules for handling virus incidents—and a rich centralized reporting tool.

a full line of network products. All of the Norton AntiVirus products generally share the same detection and removal features, as well as the same modular scanning engine and virus definition files. The only obvious difference among these products is the interface.

Norton AntiVirus is priced by platform. The NetWare and Windows NT versions are \$499.96 each for a single-server license with 10 clients; the Exchange and Notes versions are \$795 each for a single-server license with 25 clients. Symantec also offers all of the different versions on a single CD,

along with the Norton System Center. NSC lets you distribute software automatically to all client PCs and control all Windows-based clients and servers.

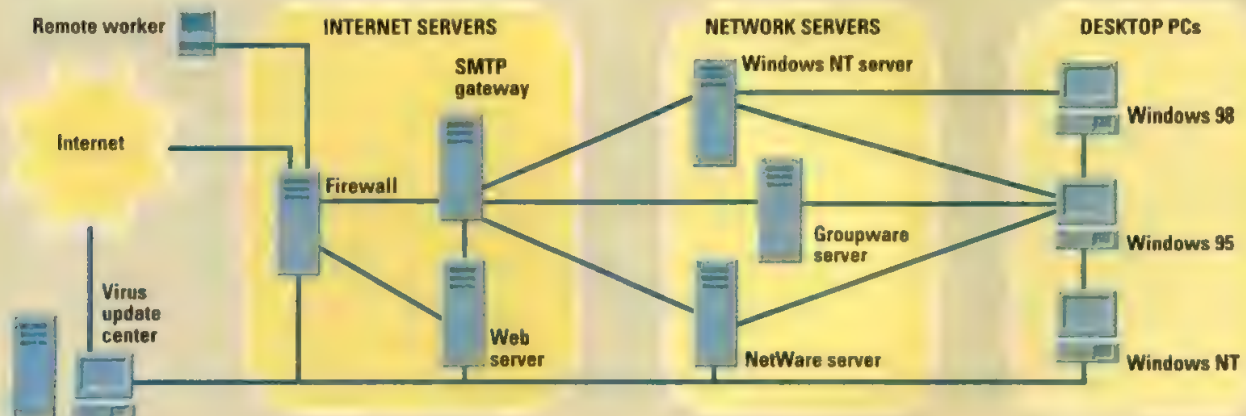
We found all of the versions to be fairly easy to install and especially liked the way Norton AntiVirus seems to work closely with the server. For example, you can administer Norton AntiVirus for Notes using the Notes client, and you can use NetWare's NWAdmin utility to configure the Norton AntiVirus NetWare Loadable Module.

All of the versions of Norton AntiVirus

PROTECTING ALL POINTS OF ENTRY

The continued growth of client/server computing, wider availability of Internet access, and increasing numbers of mobile workers all pose new computer virus threats. To cope

with these risks, you need a three-tiered strategy to guard not only desktops but also network and messaging servers and Internet gateways.



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- 100MB Iomega Zip BUILT-IN Drive
- MS® Office 97 SBE with Bookshelf (Ask about Our *FREE* MS Office 2000 Upgrade Offer); McAfee VirusScan
- MS Windows 98/IntelliMouse
- Dell QuietKey Keyboard
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- 40X Max⁵ Variable CD-ROM Drive
- Turtle Beach Montego A3D 64V Sound Card
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- Integrated Intel 10/100 Ethernet Controller
- MS Office 97 SBE with Bookshelf (Ask about Our *FREE* MS Office 2000 Upgrade Offer); McAfee VirusScan
- Microsoft® Windows 98
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- APC SurgeStation Pro8T2
- 3-Year Limited Warranty²
- 1-Year NBD On-site³ Service

\$1429

Business Lease¹⁵: \$48/Mo., 36 Mos.

 E-VALUE CODE: 04075-590414

DELL DIMENSION V333c INTEL CELERON PROCESSOR AT 333MHz

Network-Designed Desktop

- 64MB SDRAM
- 4.3GB⁴ Ultra ATA Hard Drive
- 15" (13.8" vis) 800F Monitor
- ATI 8MB 3D AGP Graphics
- 32X Max⁵ Variable CD-ROM Drive
- Integrated Intel 10/100 Ethernet Controller
- Microsoft Works Suite 99 with Money 99 Basic; McAfee VirusScan
- Microsoft Windows 98
- Dell QuietKey Keyboard
- Logitech First Mouse+ Wheel (PS/2v)
- Intel LANDesk® Client Manager v3.3
- 3-Year Limited Warranty²
- 1-Year NBD On-site³ Service
- ★ Upgrade to 64MB SDRAM, add \$49.
- ★ Upgrade to a 6.4GB Ultra ATA Hard Drive, add \$39.

\$999

Business Lease¹⁵: \$33/Mo., 36 Mos.

 E-VALUE CODE: 04075-590409

POWER UPGRADES

- 100MB Iomega Zip BUILT-IN Drive with Two Disks, add \$99.
- 250MB Iomega Zip BUILT-IN Drive with One Disk, add \$149.
- 6-Pak of 100MB Iomega Zip Disks, add \$79.
- 3Com 3C905B 10/100 NIC, add \$50.
- 3Com USRobotics V.90¹¹ PCI Telephony WinModem, add \$49.
- Intuit QuickBooks 99, add \$118.
- Intuit QuickBooks Pro 99, add \$215.
- Upgrade to Microsoft Windows NT® Workstation 4.0, add \$99.
- Upgrade from Microsoft Office 97 Small Business Edition to Microsoft Office 97 Professional Edition, add \$199.
- 3-Year Next-Business-Day On-site³ Service, add \$99.
- Upgrade from a 17" (16.0" vis, .26dp) M780 Monitor to a 17" (16.0" vis, .26dp) 1000HS Trinitron Monitor, add \$99.

Prices valid with system purchase only.

DELL DIMENSION AWARD INFO

- In 1998, Dell Dimension desktops won more than 90 product and service awards. See www.dell.com/awards98 for details.
- Winner of the 1998 PC Computing MVP "State-of-the-Art Desktop" (XPS R450) and "High-Performance PC" (XPS R400) awards (9/98).

Advertised configurations vary from award-winning configurations.

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- 3D Surround Sound with Wavetable
- Lithium Ion Battery
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- Microsoft[®] Windows[®] 98/Touchpad
- APC Notebook Surge Protector
- 3-Year Limited Warranty²

\$3599

Business Lease¹⁵: \$121/Mo., 36 Mos.

 **E-VALUE CODE: 04076-890435**

NEW DELL INSPIRON 7000 A333GT PENTIUM II PROCESSOR AT 333MHz

All-in-One Multimedia Performance

- 14.1" XGA Active Matrix Display
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- 3D Surround Sound with Wavetable
- Lithium Ion Battery
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- 3-Year Limited Warranty²

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Business Lease¹⁵: \$87/Mo., 36 Mos.

 **E-VALUE CODE: 04076-890425**

DELL INSPIRON 7000 A300LT PENTIUM II PROCESSOR AT 300MHz

All-in-One Multimedia Performance

- 15" XGA Active Matrix Display
- 32MB SDRAM (384MB Max¹)
- 4GB⁴ Ultra ATA Hard Drive
- Removable Combo 24X Max⁷ Variable CD-ROM and Floppy Drive
- 2X AGP 4MB ATI RAGE LT Pro 3D Video
- 3D Surround Sound with Wavetable
- Lithium Ion Battery
- MS Office 97 SBE (Ask about Our *FREE* MS Office 2000 Upgrade Offer)
- Microsoft Windows 98/Touchpad
- 3-Year Limited Warranty²

\$2399

Business Lease¹⁵: \$80/Mo., 36 Mos.

 **E-VALUE CODE: 04076-890423**

DELL INSPIRON 3500 A300GT PENTIUM II PROCESSOR AT 300MHz

Light Weight, Light Price

- 14.1" XGA Active Matrix Display
- 32MB SDRAM (256MB Max)
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- Modular 24X Max⁷ Variable CD-ROM
- NeoMagic[®] 256AV AGP Video
- 3D Surround Sound with Wavetable
- Lithium Ion Battery
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- Microsoft Windows 98/Touchpad
- 3-Year Limited Warranty²
- ★ Modular 100MB Iomega Zip Internal Drive, add \$139.

\$2149

Business Lease¹⁵: \$72/Mo., 36 Mos.

 **E-VALUE CODE: 04076-890421**

DELL INSPIRON 3500 C300XT INTEL[®] CELERON[™] PROCESSOR AT 300MHz

Light Weight, Light Price

- 13.3" XGA Active Matrix Display
- 32MB SDRAM (256MB Max)
- 3.2GB⁴ Ultra ATA Hard Drive
- Modular 24X Max⁷ Variable CD-ROM
- Modular Floppy Drive
- NeoMagic 256AV AGP Video
- 3D Surround Sound with Wavetable
- Lithium Ion Battery
- Microsoft Works Suite 99 with Money 99 Basic
- Microsoft Windows 98/Touchpad
- 3-Year Limited Warranty²
- ★ 3-Year NBD On-site³ Service, add \$99.

\$1799

Business Lease¹⁵: \$60/Mo., 36 Mos.

 **E-VALUE CODE: 04076-890417**

NEW DELL LATITUDE[®] CPi A366XT SMALL BUSINESS SOLUTION PENTIUM II PROCESSOR AT 366MHz

Network-Optimized Notebook

- 13.3" XGA Active Matrix Display
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- 4.3GB⁴ Ultra ATA Hard Drive
- Modular 24X Max⁷ Variable CD-ROM
- Modular Floppy Drive
- NeoMagic 256AV AGP Video
- 3D Surround Sound with Wavetable
- Lithium Ion Battery
- MS Office 97 SBE (Ask about Our *FREE* MS Office 2000 Upgrade Offer)
- MS Windows NT Workstation 4.0
- Custom Leather Case
- 3-Year Limited Warranty²

\$3199

Business Lease¹⁵: \$107/Mo., 36 Mos.

 **E-VALUE CODE: 04076-790431**

DELL LATITUDE CPi D233ST PENTIUM II PROCESSOR AT 233MHz

Network-Optimized Notebook

- 12.1" SVGA Active Matrix Display
- 64MB EDO RAM (256MB Max)
- 4.3GB⁴ Ultra ATA Hard Drive
- Modular 24X Max⁷ Variable CD-ROM
- Modular Floppy Drive
- ★ NeoMagic 128-bit Graphics Accelerator
- 3D Surround Sound with Wavetable
- Lithium Ion Battery
- MS Windows NT Workstation 4.0/Touchpad
- 3-Year Limited Warranty²
- 1-Year NBD On-site³ Service
- ★ MS Windows 98 Available, subtract \$85.

\$2399

Business Lease¹⁵: \$80/Mo., 36 Mos.

 **E-VALUE CODE: 04076-790423**

DELL NOTEBOOK AWARD INFO

- Inspiron 7000 A366LT – PC Magazine's Editors' Choice for small businesses, 1/99.
- Inspiron 3500 C300XT – PC World's Best Buy in the budget category, 4/99.

Advised configurations vary from award-winning configurations

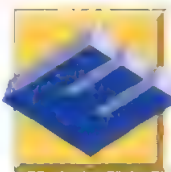
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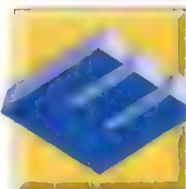
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- Dual Intel® Pro/100+ PCI Ethernet Adapters with Adaptive Fault Tolerance Software
- Integrated Dual Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- Redundant Hot-Swap Power Supplies, Cooling Fans and Processor Fans
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- 3-Year NBD On-site³ Service
- 1-Year DirectLine™ NOS Support
- 7x24 Dedicated Server Hardware Technical Telephone Support

\$12,549

Business Lease¹⁵: \$411/Mo., 36 Mos

 E-VALUE CODE: 04077-290401

DELL POWEREDGE 4300 SERVER PENTIUM II PROCESSOR AT 400MHz (DUAL PROCESSOR/RAID CAPABLE)

- 256MB 100MHz ECC SDRAM
- 9GB¹ Ultra-2/LVD SCSI Hard Drive (Hot-Swap Optional)
- HP OpenView NNM Special Edition
- Dual Intel Pro/100+ PCI Ethernet Adapters with Adaptive Fault Tolerance Software
- Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- Redundant Hot-Swap Power Supplies, Cooling Fans and Processor Fans
- 12/24GB Variable SCSI DAT Tape Backup Unit
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- 6-1.6" Hard Drive Bays/4-5.25" Media Bays
- 3-Year NBD On-site³ Service
- 1-Year DirectLine™ NOS Support
- 7x24 Dedicated Server Hardware Technical Telephone Support

\$6149

Business Lease¹⁵: \$206/Mo., 36 Mos.

 E-VALUE CODE: 04077-290461

DELL POWEREDGE 2300 SERVER NEW PENTIUM III PROCESSOR AT 500MHz (RAID 5 CONFIGURATION)

- 128MB 100MHz ECC SDRAM
- Three 9GB¹ Ultra-2/LVD SCSI Hot-Swap Hard Drives
- Ultra-2/LVD PowerEdge Expandable RAID Controller 2 (Single-Channel)
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- 6-1" Hard Drive Bays
- 4 Media Bays: 3-5.25", 1-3.5"
- 3-Year NBD On-site³ Service
- 7x24 Dedicated Server Hardware Telephone Technical Support
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Business Lease¹⁵: \$181/Mo., 36 Mos.

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DELL SERVER AWARD INFO

- *Network World* "World Class Award" – Dell PowerEdge 2300, 6/98.
- *Computer Shopper* "Top 100" – Dell PowerEdge 2300, 11/98.
- *PC Computing's* "The 'A' List" – Dell PowerEdge 6300, 11/98.
- *LANTimes* "The Best of LANTimes Over \$25,000" – Dell PowerEdge 6300, 9/98.
- *ComputerWorld's* "Leaders' Choice" Winner Workgroup Servers – Dell PowerEdge Family, 1/98.

Advertised configurations vary from award-winning configurations

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DELL POWEREDGE 2300 SERVER NEW PENTIUM III PROCESSOR AT 450MHz (DUAL PROCESSOR/RAID CAPABLE)

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- 9GB¹ Ultra-2/LVD SCSI Hard Drive (Hot-Swap Optional)
- Microsoft® Windows NT® Server 4.0 (10 Client Access Licenses)
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
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- 7x24 Dedicated Server Hardware Technical Telephone Support
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\$3899

Business Lease¹⁵: \$131/Mo., 36 Mos

 E-VALUE CODE: 04077-290438

DELL POWEREDGE 2300 SERVER PENTIUM II PROCESSOR AT 400MHz (DUAL PROCESSOR/RAID CAPABLE)

- 64MB 100MHz ECC SDRAM
- 4GB¹ Ultra-2/LVD SCSI Hard Drive (Hot-Swap Optional)
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- 4-1.6" or 6-1" Hard Drive Bays
- 4 Media Bays: 3-5.25", 1-3.5"
- 3-Year NBD On-site³ Service
- 7x24 Dedicated Server Hardware Technical Telephone Support
- ★ Upgrade to a Pentium III Processor at 450MHz, add \$400
- ★ MS® Windows NT Server 4.0 (10 Client Access Licenses), add \$799.

\$2549

Business Lease¹⁵: \$85/Mo., 36 Mos

 E-VALUE CODE: 04077-290425

NEW DELL POWEREDGE 1300 SERVER PENTIUM II PROCESSOR AT 400MHz (DUAL PROCESSOR/RAID CAPABLE)

- 64MB 100MHz ECC SDRAM
- 4GB¹ Ultra-2/LVD SCSI Hard Drive
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated PCI Ultra-2/LVD SCSI Controller
- 6 Expansion Slots: 5 PCI, 1 PCI/ISA
- 4 Hard Drive Bays: 2-1.6" and 2-1"
- 3-5.25" Media Bays
- 3-Year NBD On-site³ Service
- 7x24 Dedicated Server Hardware Technical Telephone Support
- ★ Upgrade to a Pentium III Processor at 450MHz, add \$400
- ★ Upgrade to a 9GB Ultra-2/LVD SCSI Hard Drive, add \$200

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Business Lease¹⁵: \$62/Mo., 36 Mos

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- 40X Max⁵ Variable CD-ROM Drive
- Sound Blaster Pro Compatible Sound
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- MS® Windows NT® 4.0
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Business Lease¹: \$216/Mo., 36 Mos.

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NEW DELL PRECISION WORKSTATION 410 PENTIUM III PROCESSOR AT 500MHz (DUAL PROCESSOR / RAID CAPABLE)

- 128MB 100MHz ECC SDRAM
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- Diamond Permedia 2 8MB AGP Graphics Card
- 40X Max⁵ Variable CD-ROM Drive
- Sound Blaster Pro Compatible Sound
- Integrated 3Com 10/100 PCI NIC
- Remote Client Manageability Support via DMI 2.0; Wakeup on LAN Capable
- MS Windows NT 4.0
- 1-Year NT Telephone Support
- **3-Year NBD On-site³ Service**
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Business Lease¹⁵: \$74/Mo., 36 Mos.

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Pentium® III Processor at 450MHz with 512KB L2 Cache

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128MB 100MHz SDRAM

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NEW 13.6GB Ultra ATA Hard Drive (7200 RPM)

Monitor **HELP ME CHOOSE**
17" (16.0" viewable, .28dp) M780 Monitor

Video Card **HELP ME CHOOSE**
16MB Diamond Viper TNT 3D AGP Graphics Card

DVD-ROM or CD-ROM Drive **HELP ME CHOOSE**
40X Max Variable CD-ROM Drive

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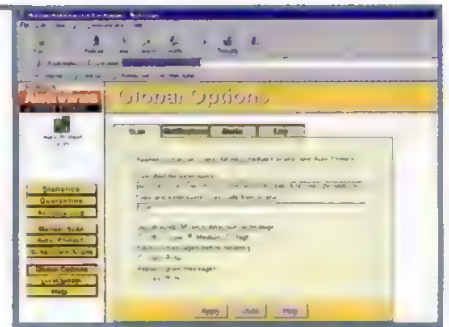
have at least three levels of protection: real-time, immediate, and scheduled scanning. While real-time scans offer probably the best protection, they put a lot of stress on your servers. Fortunately, Norton AntiVirus lets you control the amount of CPU utilization. The immediate scanning option let us run a virus scan on demand or have the software automatically start scanning when it detects a file that may be infected. Scheduled scans, which let you run Norton AntiVirus after hours, are the best option when you don't want to tie up your server's CPU during work hours.

When Norton AntiVirus finds an

Norton AntiVirus for Exchange has an HTML interface for browser-based administration.

infected file, you have several options. On our tests, we were able to choose whether to delete the infected file, clean it, store it in a quarantined location, ignore it, or send a notification to the administrator. Some of the notification options include a network broadcast, e-mail, or even a pager message. The Windows NT version even includes a utility that automatically sends a quarantined file to Symantec for further inspection.

To keep your virus definition files up to



date, Symantec includes LiveUpdate, which runs in the background and constantly checks the company's Web site for updates. You can also use LiveUpdate's administrator utility to download all the definitions to a single server and then deploy them to the client PCs. Because end users don't have to download files, this approach cuts down on bandwidth usage.

Via a feature unique among the solutions we tested, Norton AntiVirus sends only the virus signatures and engine files you don't already have. The LiveUpdate utility lets you determine how and when clients should receive updates. Unfortunately, you can't automatically distribute LiveUpdate files across multiple servers, as you can with Trend Micro's NeaTSuite and Network Associates' Total Virus Defense.

Because of Norton AntiVirus's modular architecture, when you update Norton AntiVirus' definition files, you get a new scanning engine—without rebooting. This ensures that your system can detect and clean the latest viruses.

The Norton AntiVirus network solution carries Symantec's desktop reputation for thorough protection in an easy-to-use package to the enterprise.

Total Virus Defense Enterprise

5,000 nodes or more, \$14 per node list. Network Associates Inc., Santa Clara, CA; 800-332-9966, 408-988-3832; www.nai.com.

● Although the individual components have different names, Network Associates' NetShield for NetWare and NT and GroupShield for Exchange and Notes are all part of a new solution known as Total Virus Defense (TVD) Enterprise 4.0. Though each product is sold separately, TVD gives you centralized management and a utility for managing updates to virus definition files. The TVD suite also includes modules for firewalls and Internet proxy servers. Add in the recently

PERFORMANCE TESTS

Network Antivirus



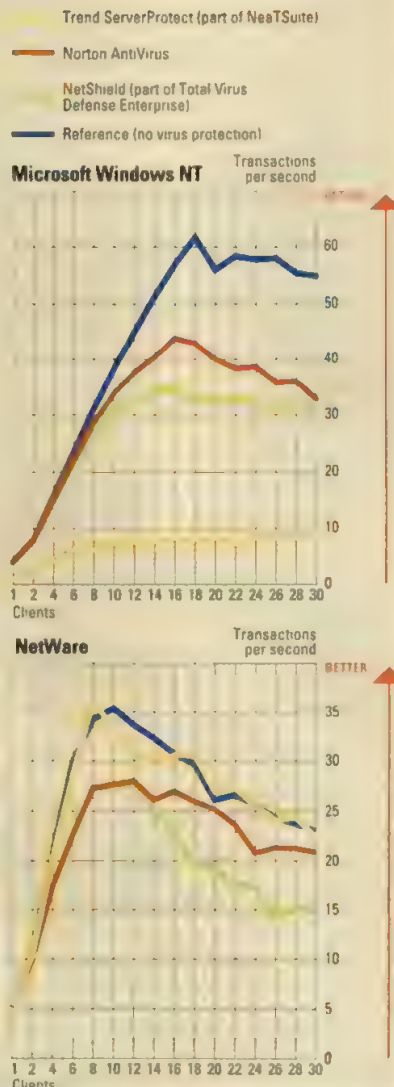
Our performance tests gauge the impact of antivirus solutions on the

performance of NetWare and Windows NT servers.

Symantec's Norton AntiVirus 5.0 had the best all-around performance, followed by Network Associates' Total Virus Defense Enterprise 4.0. But Trend Micro's NeaTSuite produced wildly differing results depending on the platform. On NetWare, NeaTSuite was an outstanding performer, producing almost no overhead. On the other hand, on our Windows NT test, NeaTSuite failed to crack 10 Mbps on our 100-Mbps network. We suspect this had something to do with the Trend Micro product's scanning of outgoing files. Trend Micro is aware of our findings and promises a fix for the problem by the time you read this.

To measure performance, we ran the ZD NetBench program on a clean network server to obtain reference scores. We used NetBench 5.01's Disk Mix test to add a scalable, disk-intensive load. Then we installed the antivirus software, configured it to scan both incoming and outgoing traffic, and ran the NetBench tests a second time. Our client test-bed consisted of a total of 30 Windows 95 clients including 16 Dell Dimension XPS Pro200n units, 8 Dell Dimension XPS P166 units, and 6 Dell OptiPlex Gxa units (32MB RAM each), connected over 100-Mbps Ethernet and TCP/IP for Windows NT and IPX for NetWare.

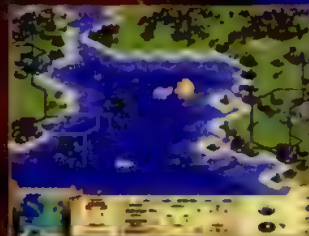
—Analysis written by Russ Iwanchuk



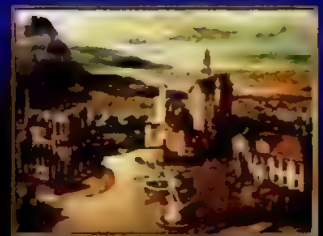
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DETECTING INTERNET-BORNE VIRUSES

As more businesses of all sizes give their employees Internet access, the chances of a computer virus finding its way to your network multiply. According to the International Computer Security Association (ICSA), virtually all medium to large businesses have experienced virus incidents (1998 Virus Prevalence Survey). Not surprisingly, e-mail is the leading method of virus transmission.

While most administrators are diligent about protecting their file servers and desktop clients, they often leave their Internet connections unprotected and hope the firewall will keep them safe from virus attacks. Unfortunately, firewalls care only about where a file came from, not what it contains, making them poorly equipped to cope with viruses. Fortunately, all of the vendors in this review offer protection for firewalls, proxy servers, and e-mail servers.

Different servers require different types of protection. For example, HTTP is the carrier for ActiveX controls and Java applets, which could contain viruses that must be removed before they reach the browser. To protect e-mail (SMTP), the products must open up each database and look for any hidden viruses attached to the message before the

recipient reads it or forwards it to others. Finally, FTP is a perfect way to download applications that could be laced with a virus.

Products such as Trend Micro's InterScan VirusWall, Symantec Corp.'s Norton AntiVirus for Firewalls, and Networks Associates' WebShield address all these threats by scanning all packets coming in from the Internet including HTTP (Web), SMTP (e-mail), and FTP (file transfer). Most of these products run on Windows NT, but some are also available for Sun Solaris. Norton AntiVirus for Firewalls and WebShield come free with the standard network suites. InterScan VirusWall costs \$21 per node.

These Internet antivirus products are fairly easy to set up, but they require a little more effort than the LAN-based solutions reviewed in our main story. For example, the administrator must configure the IP address and TCP port number for each service running on the different servers. Once set up, these products provide the same detection, disinfection, and notification options as desktop and network server solutions. In addition, they can be administered from the centralized tools bundled with the suites.—SR

acquired Dr. Solomon's virus engine and you've got a powerful antivirus solution.

If you opt for the suite, which provides virus protection at almost every network level, the pricing varies depending on the number of licenses you require. For example, a 5,000-node setup costs about \$14 per node. Like the other two suites, TVD comes on a single CD with separate manuals for each platform.

The first features we noticed about TVD were the Net Tools Console and the Dr. Solomon's Management Engine. These Windows-based utilities let us configure all of the individual antivirus products from a single console. For example, we were able to schedule virus scans and set procedures for detecting and cleaning viruses for all of our Windows NT- and

NetWare-based servers from a single client PC. When using the GroupShield products, you can also use the Exchange and Notes administration utilities to select message stores to protect and schedule virus scanning sessions.

In addition to scheduled scans, TVD lets you configure real-time and on-demand scanning sessions. When a virus is detected, you can have the program ignore the file, delete it, clean it, quarantine it, or simply notify the administrator. TVD did allow us to send files to the Network Associates engineers, but this process is not as automated as it is with Norton AntiVirus.

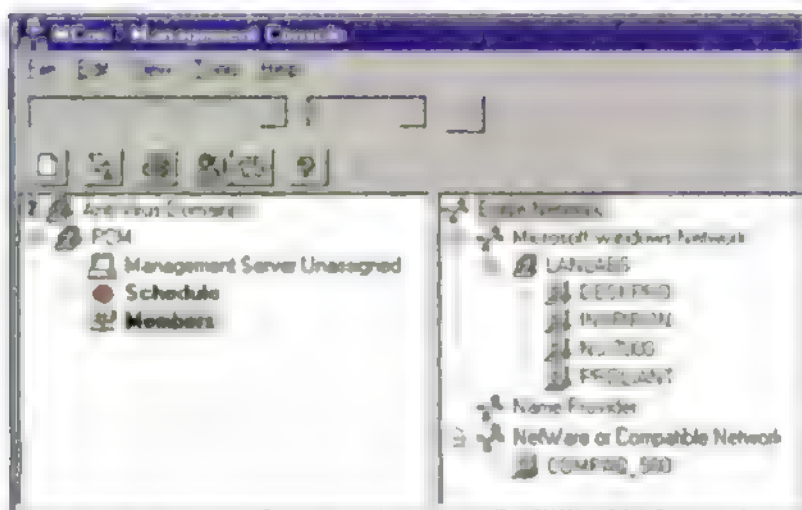
Like the other solutions reviewed here, TVD includes heuristic algorithms for detecting unknown viruses. The Auto-Immune server does not attempt to disin-

TVD's Enterprise SecureCast can alleviate the pain of keeping virus definition files current. Like Trend Micro's Total Virus Control System, the SecureCast server automatically pushes the updated definition files to all of the clients and servers based on a schedule you set. By contrast, Norton LiveUpdate can "publish" new virus definition files, but end users have to request the updates to complete the process. SecureCast also lets you distribute the update repository to multiple local servers on the WAN.

An alternative to SecureCast, the AutoUpdate feature is a pull technology that you configure on each client PC so that it will automatically retrieve virus definition files based on a set schedule. Neither SecureCast nor the AutoUpdate feature support incremental updates; you must push or pull the entire file.

One feature administrators will really appreciate is the notification and reporting tool AutoInformant. This utility provides an analysis of virus outbreaks, monitors the deployment of antivirus software, and even generates total cost of ownership reports.

Delivering total enterprise virus protection, Total Virus Defense Enterprise lives up to its name. 



TVD Console can control antivirus settings for both NetWare and Windows NT.

fect these viruses, however. (Norton AntiVirus was the only product we looked at that provided this feature for cleaning macro viruses.) Unlike Norton AntiVirus, TVD doesn't let you configure a list of acceptable macros and send it to end users to help prevent false positives.

INSTRUCTIONS:

- 1. Cancel order for desktop printer.**
- 2. Order new HP LaserJet 1100A printer • copier • scanner.**
- 3. Attach Greeting Card.**
- 4. Deliver to end user.**

**Remove card
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Resolution (all functions)..... 600 dpi
Size (w x d x h)..... 14.5 x 15.8 x 14.9 in
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OS Support..... Windows® 3.x, 9x, NT 4.0
Networkable via HP JetDirect

Scans directly to e-mail for easy document exchange. Includes integrated desktop software for organizing scanned documents and a professional version of OCR software for editing text.

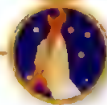
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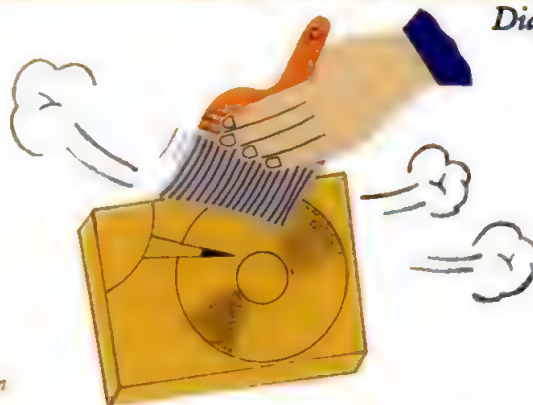
\$399*





TUNE UP YOUR PC

All reviews by Barry Simon



Like the local handyman, today's diagnostic package wears many hats. It can spot problems such as software and hardware conflicts or missing DLLs and repair them. It can help prevent problems before they occur by stepping in prior to system crashes or restoring files you accidentally deleted. And it can enhance system performance by defragmenting your hard disk and cleaning out junk files. Ultimately, however, all diagnostic packages have a single goal—to keep your system up and running.

Sounds good, but diagnostic programs are not for everyone, for a couple of reasons. First, thanks to developments such as Plug and Play and applications with built-in uninstallers, the Windows operating environment is a little less prone to trouble these days. Second, many of the features that were once the province of special-purpose tools, such as disk defragmentation, are (surprise!) now part of Windows. Therefore, if your PC isn't broke, you may want to think twice before using one of these programs to fix it.

That's not to say that some users won't find the tools in the four programs reviewed here—Check-IT 98, First Aid 2000, Norton Utilities 4.0, and Nuts & Bolts 98—to be invaluable. Indeed, they go way beyond what Windows offers with tools that can, for instance, compress the Registry and swap files for better performance. So if you like to make your own repairs or fine-tune your system, you'll find a lot to like in these comprehensive packages.—*Matthew Graven*

Check-IT 98

\$50 street. Touchstone Software, North Andover, MA; 800-800-2467, 978-686-6468; www.touchstonesoftware.com.

● Touchstone Software's Check-IT 98 excels at analyzing and reporting on your system's hardware. But while its reporting capabilities are top-notch, Check-IT falls short of the other products in areas such as software and system troubleshooting and optimization.

Designed for Windows 95 and 98, Check-IT is available alone for \$50 (street) or as part of the Check-IT 98 Diagnostic Suite (\$130), which includes batch testing, NetOptimizer, FastMove!, a file transfer cable, and loop-back plugs for parallel and serial port testing. Like the other products in this roundup,

Check-IT doesn't run on Windows NT.

Of the products we tested, Check-IT performs the most thorough hardware testing. And it includes a Y2K module that can add corrective programs to your autoexec.bat if needed to overcome BIOS limitations.

Check-IT's strongest feature is its reporting; Check-IT has long been the king of IRQ and DMA channel reporters. It reports on drive usage, memory, basic peripherals, and system buses, including IrDA and SCSI. Check-IT's resource reporting for our test system was perfect, and the modem report is especially com-

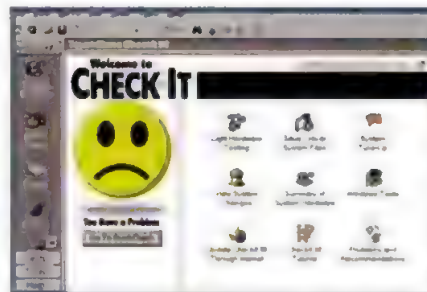
prehensive, including max port speed and the current modem initialization string.

Unfortunately, many other reports are less comprehensive than we'd like. Free disk space, for instance, is indicated by drive but not by folder. And while information about the SCSI controller is provided, Check-IT fails to report used and free SCSI IDs.

The troubleshooting modules in the program are well thought out and intuitive. For example, when troubleshooting a bad mouse, the program asks whether mouse motion is jerky. If you reply yes, it suggests that the mouse ball needs to be cleaned and instructs you on how to do that.

With regard to other aspects of system troubleshooting and testing, the program is marked by what it doesn't provide. For instance, Check-IT includes no defragmenter or scan disk, no crash protector, and no method of dealing with bad shortcuts and missing DLLs. And despite its ability to track changes in the autoexec.bat, config.sys, and various .ini files, Check-IT fails to track registry entries and offers no registry optimizer or troubleshooter.

To keep your Check-IT 98 software current, TouchStone includes an automated update service. Although TouchStone claims this works through a proxy



Check-IT 98's main screen provides access to all its features.

server, we were unable to verify this because the company's server was being moved

during our testing. On our Winstone tests, Check-IT caused a performance hit of 14 or 15 percent on our system.

Check-IT is limited in scope compared



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“We recommend that you consider SQL Server 7.0 for new data warehousing projects ranging from departmental and line-of-business

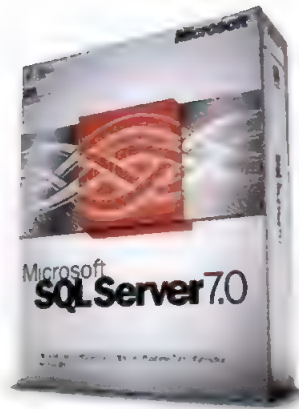
data warehousing

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PC Week Best of Show, COMDEX 1995

**Database and Server Software
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EDITORS' CHOICE

• Norton Utilities 4.0



While not all users will want to venture into the depths of these products, advanced users looking to clean up and optimize their system performance will

find these tools invaluable. And this year's Editors' Choice, Symantec Corp.'s Norton Utilities 4.0, offers the best tools for cleaning up junk files and bad Registry entries, detecting conflicts, and monitoring system performance. Although Network Associates' Nuts & Bolts 98 offers similar capabilities, Norton Utilities edged out Nuts & Bolts because of better inte-

gration with Windows 98.

Norton Utilities' vast collection of tools includes monitoring of system resources, crash protection, disk scanning, disk defragmentation, and various Registry tools. The Registry Tracker, a particularly useful feature, lets you roll back changes. Although Norton Utilities offers limited hardware diagnostics, it more than makes up for this lack in other areas.

with the other products in this roundup. But if you're looking for a hardware diagnostic utility, Check-IT's functionality is first-rate. And since it nicely complements the other products reviewed here, you may want to consider it in addition to one of the comprehensive troubleshooting packages.

First Aid 2000

\$40 street. Network Associates Inc., Santa Clara, CA; 800-338-8754, 801-492-2700; www.mcafee.com.

● Formerly a CyberMedia product, Network Associates' First Aid 2000 requires the least user knowledge and intervention of any product in this section. First Aid, however, lacks the depth and capabilities found in Norton Utilities 4.0 and Nuts & Bolts 98.

With support for both Windows 95 and 98, First Aid is available alone for \$40 (street); as a component of First Aid Deluxe (\$60), which adds UnInstaller and

Oil Change; and as a component of McAfee Office (\$60), which comprises Nuts & Bolts, McAfee VirusScan, Guard Dog, PGP, 2000 Toolbox, and Hurricane.

Simplicity is First Aid's strong point. For many users, the Checkup button, which appears on the opening screen, will be as deep as they need to go. This function runs a battery of tests, including basic hardware diagnostics, a disk scan, a virus scan, a search for bad shortcuts and Registry entries, and an analysis of various Windows parameters. It then presents a list of the problems discovered as well as any automatic fixes that are available.

A useful function is First Aid's ability to locate missing DLLs when a program loads. And the Universal Undo can roll back simple program installs and Registry changes.

Unfortunately, First Aid lacks many of the features found in Nuts & Bolts and Norton Utilities 4.0. For instance, it has no swap file or Registry optimizer, Registry tracking, or protected trash bin.

Though the product has incorporated some good features from other Network Associates products, their implementation doesn't seem very carefully thought out. The Checkup feature, for example, runs the Disk Minder engine, which has been borrowed from Nuts & Bolts. But the Tools

A NEW FIX

Mijenix Corp. is prepped to join the field Windows and take on Symantec's Norton Utilities 4.0 and Network Associates' Nuts & Bolts 98 head to head. **Fix-It Utilities 99** (\$50 street), which should be available by the time you read this, offers a host of tools to help you take better control of your system while improving its performance. But unlike the four products in our main reviews, Fix-It not only supports Windows 95 and 98 but also runs on Windows NT.

To start, Fix-It includes all the standard tools such as defrag and scan disk, as well as tools to fix and optimize your Windows Registry. Meanwhile, the DiskCleaner feature can automatically clean out specified file types to free up valuable disk space. Fix-It also includes antivirus software.

Distinguishing itself from Norton Utilities, Fix-It includes more advanced hardware diagnostics that test hardware devices and troubleshoot problems. The Year 2000 Diagnostics feature can install a driver patch to update an older PC with a noncompliant BIOS. And the System Explorer offers detailed information about your system and its components.

Fix-It also includes crash protection and tools for backing up critical system files. Unique to Windows NT, System Lifeline allows you to boot crashed NT systems into a workable mode where problems can be fixed. Fix-It also includes undelete capabilities for retrieving files that were deleted in DOS or emptied from the Recycle Bin.

Rounding out the package, Fix-It includes the WinCustomizer to help users customize their Windows environment and an enhanced file manager that offers built-in Zip and security software, a variety of file viewers, and folder synchronization.

In an interesting move, Mijenix will also offer Fix-It as an online product. Besides the diagnostic tools, Fix-It.com will provide live technical assistance, a library of related resources, and a tool that can analyze your system and update your software. Subscriptions will be on a monthly basis. Some support features, however, will be charged per use. (Mijenix Corp., Boulder, CO; 800-645-3649; www.mijenix.com.)—MG



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menu runs Windows ScanDisk, a less powerful alternative. And although Checkup attempts to fix broken shortcuts by searching for the program that's been moved, the Tool Menu's Quick Clean program offers to delete only the errant shortcut.

Like Norton Utilities and Nuts & Bolts, First Aid caught most of the crashes on our tests. Its Autofix option, which we were offered on most crashes, restored the application. On our Winstone tests, First Aid caused a system performance loss of only 2 percent—compared with 6 percent or more with the other programs.

Despite lacking the depth of features that power users may desire, First Aid is a great alternative for less experienced users who still want to know what's going on inside their PC.

Norton Utilities

\$50 street. Symantec Corp., Cupertino, CA; 800-441-7234; www.symantec.com.



The long-time powerhouse in this category, Norton Utilities is a comprehensive package of troubleshooting and diagnostic tools that are well integrated with Windows 98.

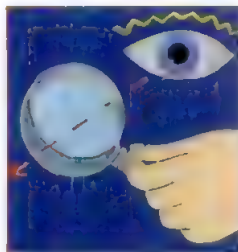
Designed for Windows 95/98, Norton Utilities 4.0 is available as a standalone product for \$50 (street) or as part of two bundles: Norton System Works Standard Edition (\$70) adds Norton AntiVirus, Norton CleanSweep, and Norton Web Services, whereas the Professional Edition (\$100) adds these features as well as Norton Ghost and Norton 2000.

Norton Utilities includes a series of components that Symantec calls Doctors. Included are the Disk Doctor, which checks the logical structure of your hard disk; the System Doctor, which monitors and displays system resources; and the Win Doctor, which analyzes Registry integrity and checks for Registry and shortcut errors. New to Version 4.0, the Norton Connection Doctor performs a thorough modem checkup. All of the doctors performed well on our tests.

Unlike Nuts & Bolts, Norton Utilities is well integrated with Windows 98. Using the start-up information logged by the operating system, Speed Disk, Norton's defragmenter, intelligently places all the pieces that a program uses during start-up.

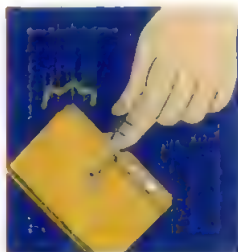
DISSECTING DIAGNOSTICS PACKAGES

The diagnostic products we tested are expected to perform a variety of tasks. And while each product varies in what tools it offers, these are the basic components that make up a typical package.



Diagnostics

The diagnostics that these products perform typically fall into two categories. The more common is software diagnostics, which analyzes and optimizes software and the operating system. Hardware diagnostics, on the other hand, test and monitor hardware devices while detecting system conflicts.



Uninstallers

Some of these products include uninstallers that help you remove a program from your system. The uninstaller also removes the appropriate DLLs and edits your Windows Registry. Certain diagnostic products also include tools for recovering lost or deleted files.



Crash Protection

Excluding Check-It 98, each of the products we tested provides a crash protection utility that is designed to catch a system crash and either return your system to a stable state or, at the very least, let you save your work before rebooting.



Tune-Up

Probably the most common task these products are used for is tuning up your system's performance. For this, diagnostic products offer tools for defragmenting your hard disk, performing disk scans, and fixing and compressing the Registry. Norton Utilities 4.0 even optimizes the placement of the pieces of a program on the hard disk to improve start-up.



	Check-IT 98	First Aid 2000	Norton Utilities 4.0	Nuts & Bolts 98
System tune-up and optimization	N/A	Fair	Excellent	Excellent
Protection and troubleshooting	N/A	Good	Excellent	Good
Software diagnostics	N/A	Good	Good	Good
Hardware diagnostics	Good	Good	Fair	Good
Reporting	Excellent	Good	Good	Good

N/A—Not applicable. The product does not have this feature.

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- 9.1GB Ultra2 SCSI hard drive
- 17" (16" viewable) monitor with Trinitron™ technology
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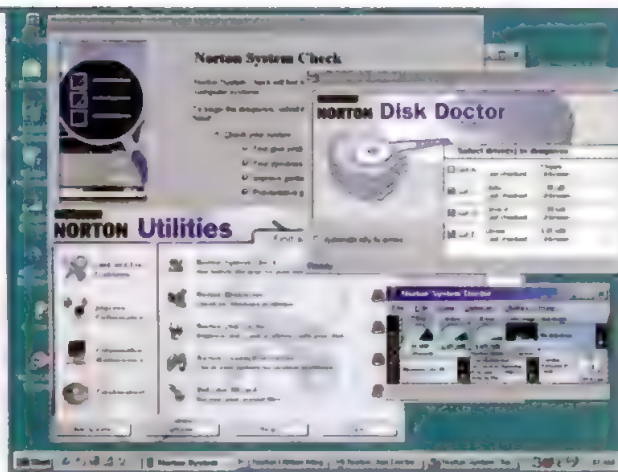
Norton Utilities lets you run many trouble-prevention tests at once.

Although Norton uses its own scheduler when it runs on Windows 95, under Windows 98 it uses the OS's scheduler. Furthermore, various program options are available through the scheduler.

Norton Utilities falls short with its Rescue Disk, however. Like the Nuts & Bolts Rescue Disk, Norton's Rescue Disk lacks the CD drivers that Windows 98 now puts on its Emergency Start-up Disks.

We found Norton's Registry tools particularly useful. The Registry Editor lets you bookmark branches for easy access, whereas the Registry Tracker lets you roll back changes. But unfortunately, it does not track changes made when double-clicking a .reg file.

Norton's main weakness is hardware diagnostics. These are provided by an outdated and limited DOS program that isn't even placed on the Start menu. In fact, to run it, you must know to look for the file ndiags.exe. Also hidden in a DOS



program is the low-level sector editor diskedit.

The new-system check can be configured to run on a regular basis. In doing so, you can avoid running any resident parts other than CrashGuard. On our crash tests, Norton CrashGuard successfully caught the same crashes as Nuts & Bolts 98 and First Aid 2000. On our Winstone tests, Norton Utilities caused an 8 percent performance hit. This is presumably a result of the package's low-level event tracking.

Excluding a few areas such as hardware diagnostics, Norton Utilities provides a pleasant interface as well as all the components one needs for troubleshooting and optimizing a system.

Nuts & Bolts 98

\$50 street. Network Associates Inc., Santa Clara, CA; 800-338-8754, 972-278-6100; www.mcafee.com.

● The most complete troubleshooting package in this roundup, Network Associates' Nuts & Bolts 98 is marred by weak integration with Windows 98.

A standalone version of Nuts & Bolts 98 (\$50 street) is available for Windows 95/98. The product is also included in two bundles: Nuts & Bolts Deluxe (\$70), which contains McAfee VirusScan, Oil Change, and Hurricane; and Nuts & Bolts Platinum (\$80), which has all of the above plus UnInstaller.

Besides offering all the troubleshooting, optimization, and diagnostic components you expect, Nuts & Bolts has some stand-out features. EZSetup, for example, gives you access to Windows options that would otherwise require hand editing in the Registry. And its Discover Pro feature offers exemplary reporting and diagnostics.

For those who crave extras, the package includes encryption, a ZIP file manager, virus scanner, and an application launcher as well. Nuts & Bolts also enhances the Windows Open/Save dialogs with the ability to track previous files and directories accessed on a program-by-program basis.

Unfortunately, these good features are undermined by the product's poor

HOW WE TESTED CRASH PROTECTION

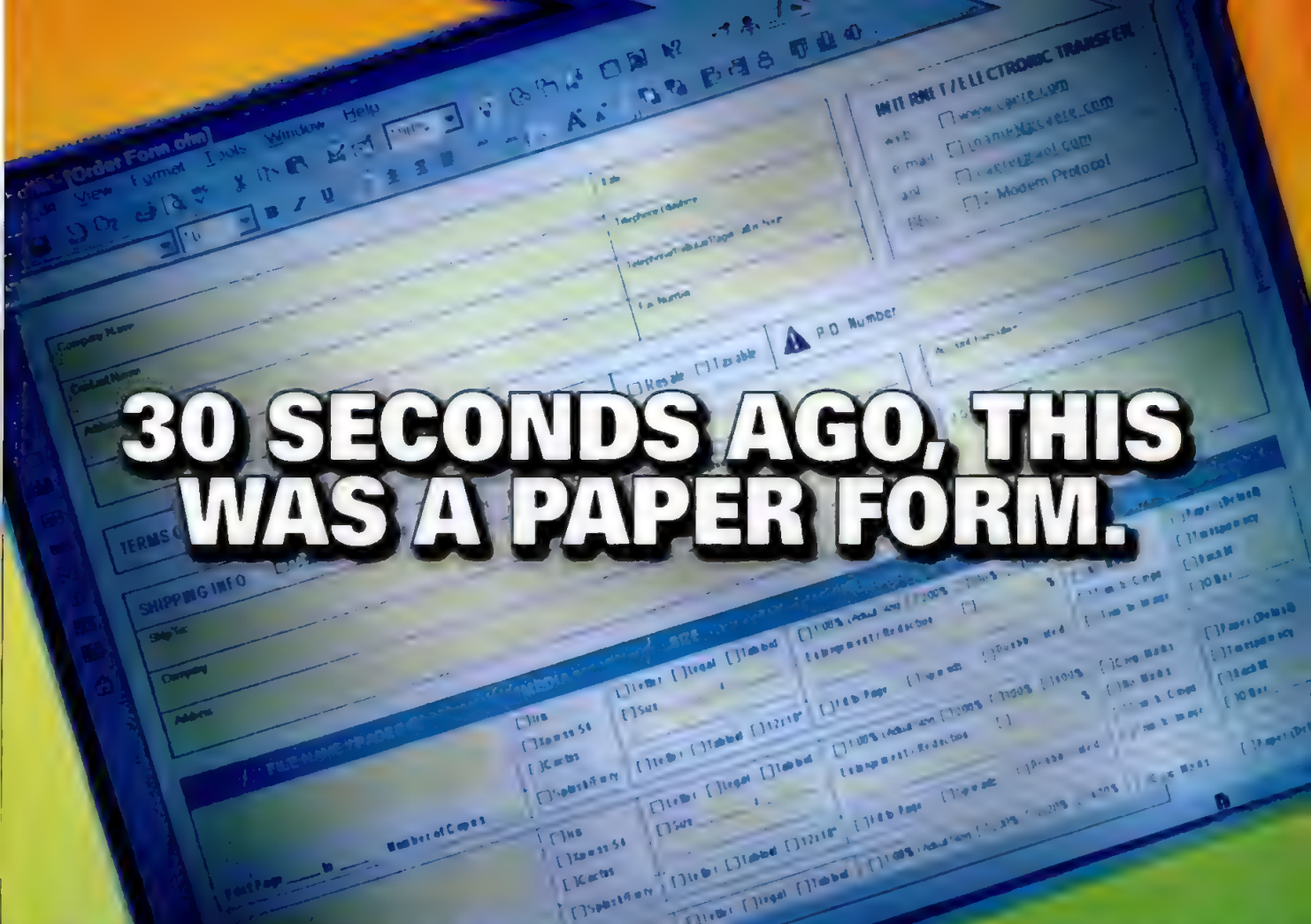
When you least expect, your system inevitably crashes. But just try making it crash on cue. That was our dilemma in testing the crash protection modules in these diagnostic packages. Eventually, we managed to assemble a roster of eight reproducible crash scenarios—four from a program that demonstrates bugs created by common programmer errors, two from an online bug service, and the remaining pair discovered during testing in our lab—which we used to test crash protection under Windows 95/98. The results were revealing.

All the crash protection programs detected most of the crash scenarios and produced a dialog box with options for resolving the problem. The differences lie in how these programs react once a crash has been intercepted. Network Associates' First Aid 2000 and Nuts & Bolts 98—which both offer crash protection—typically let us return to the application we were working in and save our work before

restarting. This is obviously the ideal resolution. In one instance, Symantec Corp.'s Norton CrashGuard (part of Norton Utilities 4.0) offered the same solution, but more often it recommended closing the application immediately rather than returning to the app. Touchstone's Check-IT 98 does not offer crash protection.

One caveat: All of our crash protection tests were performed using clean systems that were running only Windows and the applications that triggered the crashes. By contrast, in the real world, where PCs run multiple applications, the potential for conflicts that induce system crashes is significantly greater. Furthermore, real-world systems don't always behave predictably. In fact, even in our controlled test environment, the test systems did not always react to the same crash scenario in the same way.

The best advice is that if you're experiencing stability problems, one of these crash protection modules is worth a try. Just don't expect any miracles. —Jay Munro



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UNINSTALLERS: CLEANING ISN'T EVERYTHING

Uninstaller software came about in the early days of Windows to handle the troublesome junk files left behind when you removed an application from your system. But today's applications remove themselves cleanly, forcing uninstallers to find a new niche. Now uninstallers perform such valuable tasks as optimizing the Windows Registry, removing junk files stored by Web browsers, moving entire applications to different folders or computers, and cleaning up debris left by badly written programs.

WinDelete 5.0 (\$40 street) suffers from a cramped and uninformative interface that looks haphazardly thrown together. Though it can safely remove old applications, browser plug-ins, and other debris, its installation monitor is impressively fast.

When WinDelete displays a list of files it proposes to remove, you have the option of launching the listed program or data files by clicking on them. Unfortunately, no further information is available about DLL and other crucial files.

WinDelete operates in either an advanced mode or a basic mode that switches off risky features like DLL removal. Neither mode has any functions for cleaning out invalid registry entries. And although a unique feature searches for files that fit your specification and can then either archive or transport them, WinDelete simply can't match the competition. (IMSI, Novato, CA; 800-833-8082; www.imsisoft.com.)

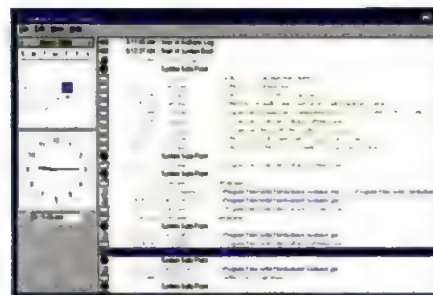
Uninstaller 5.1 (\$20 street) combines some impressive abilities with annoying quirks. The PowerClean module removes invalid registry entries and other hard-to-find system detritus, while lists of discardable files, Internet debris, and other items are sorted by category. The contents of all files can be viewed so you can easily decide what to keep. The QuickClean module clears out junk files, while SpaceMaker frees up as much space as you instruct it to.

Uninstaller's registry-cleaning features are better organized and more powerful than anyone else's. Unfortu-

nately, Uninstaller scans your disk very slowly, not allowing you to interrupt the scan. And even after minor operations, it stops to update its database. Furthermore, on one of PC Labs' test systems, Uninstaller had to be installed and removed three times before it would remove applications, and the install monitor ignored some installations. (Network Associates Inc., Santa Clara, CA; sales, 800-338-8754; support, 801-492-2700, www.mcafee.com/cybermedia.)

Norton CleanSweep 4.5 (\$40 street) works quickly and conservatively to clean out applications, invalid registry entries, and other debris.

CleanSweep lets you remove applications with just a few mouse clicks. And as with Uninstaller 5.1, users can view the contents of individual files before deciding whether to discard them. The separate Fast & Safe Cleanup application frees disk space quickly and reliably, and the Registry



GoBack lists prior states and lets you roll back changes made to your system.

cleanup feature generates a huge list of possible invalid entries.

Despite minor inconveniences (such as the inability to resize some file list windows) CleanSweep's speed, reliability, and interface make it our first choice in its field. (Symantec Corp., Cupertino, CA; 800-441-7234; www.symantec.com.)

Taking a slightly different approach, **GoBack 2.1** (\$70 street) keeps a database of changes made to your Windows 9x system. Conveniently, GoBack loads before Windows, so if your system suddenly won't boot correctly, you can simply restore an earlier configuration. Unfortunately, GoBack requires a large amount of hard disk space and system resources. (Wild File, Plymouth, MN; 888-945-3345; www.wildfile.com.)—Edward Mendelson

integration with Windows 98. Unlike Norton Utilities, Nuts & Bolts offers no direct link to the Windows 98 Task Scheduler, nor do any Nuts & Bolts options appear in the scheduler. Though DiskTune, Nuts & Bolts' defragger, can use Windows 98 program load information to provide better performance, this is not the default. Furthermore, the Discovery reports on IRQ and DMA are available only under Windows 95, and the included Rescue Disk does not provide

the CD drivers that Windows 98 offers.

Bomb Shelter, the included crash protection utility, offered ample protection on our tests, with the option to close or recover. And on our Winstone test, Nuts & Bolts caused a 7 percent performance hit.

A few problems did surface during testing, however. The program's unerase feature did not work on files deleted in a DOS window. It also doesn't support the proxy server (Osis Software's WinProxy) that we used when testing Internet updates

through a proxy. In custom mode, its space saver offered to delete essential files like *systray.exe*. Like Norton CrashGuard, Nuts & Bolts did very well on our stand-alone crash tests. But unlike Norton, it had conflicts when the Windows 98 (Dr. Watson) or Lotus Notes (Quincy) crash debuggers were also running.

Nuts & Bolts 98 has some attractive features. But because of some glitches and poor integration with Windows 98, it can't match Norton Utilities 4.0. **PC**



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SERVICE YOUR PC ONLINE

By Edward Mendelson



The Internet changes everything, and utilities are no exception. Today, you can perform online many of the system chores that once required dedicated software.

Online update services such as Symantec's Norton LiveUpdate Pro and Network Associates' Oil Change have been around for some time. But more exciting online tools are arriving. Trend Micro's HouseCall, Intel AnswerExpress Support Suite, and Network Associates' McAfee Clinic are suites that include services such as virus scanning, online backup, and technical support. Online services offer some advantages over software, letting you keep programs, hardware drivers, and virus definition files up to date. But there are disadvantages. An online virus scanner, for instance, can't keep a constant vigil for invading viruses; it can only tell you if your system has already been infected. Online utilities services won't replace software, but they can be useful in a pinch. ☹

HouseCall

Free. Trend Micro Inc., Cupertino, CA; 800-228-5651, 408-257-1500; www.antivirus.com.

● From the makers of PC-cillin, Trend Micro's HouseCall is a free service that scans your hard disk for viruses through a Web browser.

To start a scan, you simply go to www.antivirus.com and click on HouseCall. If you use Microsoft Internet Explorer 3.0 or later, an ActiveX control downloads automatically, displays a list of drives on your system, and lets you select one or more drives to scan in a single step. A separate program running outside the browser performs the scan and displays the results. If you use Netscape Communicator or Navigator 3.01 or later, the same functions are performed within the browser by a Java applet.

In testing, HouseCall correctly detected a "joke" program that scrambles DOS screens. But it also reported three false positives when scanning old DOS utilities. Fortunately, when we told the program to clean the false positives, it did nothing to the files.

HouseCall is fine for a quick scan when you need it, but it is not a replacement for a standalone antivirus program.

Intel AnswerExpress Support Suite

First three months, \$49.95; then \$9.95 a month. Intel Corp., Hillsboro, OR; 888-795-7357; www.answerexpress.com.

● Despite its name, Intel AnswerExpress Support Suite is not really a suite but a combination of software, online services, and telephone support. The initial fee (\$49.95) covers three months of virus scanning, online backup (provided by Connected Online Backup), and telephone support that responds to e-mail queries about more than 200 apps.

AnswerExpress's weak point is its virus scanning, which runs off-line in either continuous-protection or on-demand mode. At the time of our testing, the most recent virus definition file was dated July 1998.

And the program automatically attempts to clean files without giving you other options.

The virus-scanning module also crashed on our system, which gave us an opportunity to test AnswerExpress's technical support. The technicians were highly knowledgeable and instantly identified the problem: a conflict with the latest version of a Windows support file. Intel promises that this bug will be fixed in the next version, due out by mid-1999. The new version will also have a new virus-scanning engine.

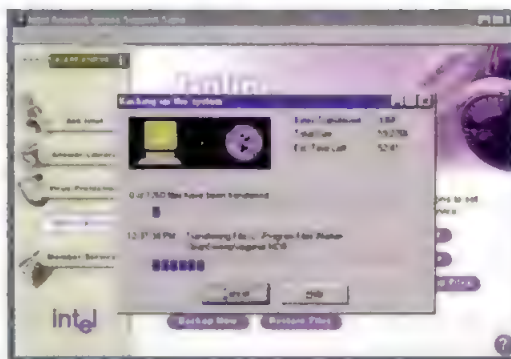
Strictly as a technical support service, Intel AnswerExpress Support Suite is a good choice for small to medium-size businesses. As a utilities service it is weak.

McAfee Clinic

\$5.95 a month. Network Associates Inc., Santa Clara, CA; 408-988-3832; www.mcafee.com.

● Like Intel AnswerExpress Support Suite, Network Associates' McAfee Clinic offers a combination of services and support for a per-month fee. In this case, the services include virus scanning, hard disk cleanup, and disk optimization. The support section is an online library of information and links but does not include e-mail or telephone support.

Everything in Clinic works within the browser window. The introductory version supports only Internet Explorer



Intel AnswerExpress Support Suite, the most versatile of the services we tested, includes online backup.

(any version), but the final service, due out by the time you read this, should also support Netscape Navigator.

On the virus scanner page, you select the drive or folder you want to scan from a Windows Explorer-like list. During testing, scan-



ning proceeded quickly and accurately, without triggering false positives.

The QuickClean module identifies files (and broken shortcuts) for deletion. Most of the files QuickClean listed were expendable, but all the shortcuts and some of the temporary files were not. Worse, QuickClean is an all-or-nothing proposition: You can't remove individual files or categories of files from its list.

McAfee Clinic's virus scanner is one of the best available online, but the QuickClean and Advisor technical support features still need some work. Stick with a standalone antivirus program; you'll get more protection and save money.

Norton Web Services

\$29.95 a year or \$3.95 a month. Symantec Corp., Cupertino, CA; 800-441-7234; www.nortonweb.com.

● If you've ever used a Symantec utility, then you're probably familiar with the LiveUpdate feature. The same technology is used in Norton LiveUpdate Pro, the central feature of Norton Web Services that offers program updates and computing tips from ZDNet (the online division of *PC Magazine's* parent company). As a feature, LiveUpdate Pro has earned kudos for its ease of use; on its own the service is not as compelling.

You register for LiveUpdate Pro

Oil Change provides lots of details on potential upgrades, but many turn out to be old versions of the applications.

through your browser, then download the LiveUpdate Pro application, which scans your system and checks the Web for updates. The main screen is a dialog box with tabs for updating software, hardware drivers, browsers and plug-ins, and miscellaneous shareware.

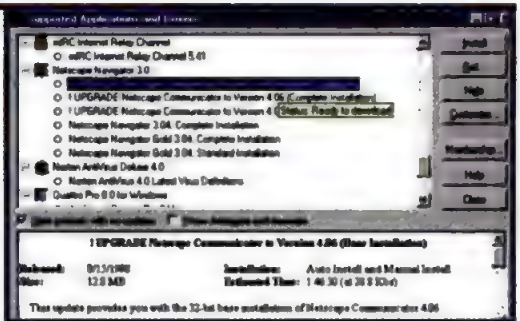
On our tests, the program worked slowly, and although it offered an extensive list of updates, some of these were really downgrades; LiveUpdate Pro proposed to upgrade our system to DirectX 6.0 when 6.1 was already installed, and tried to replace Sound Blaster drivers with older ones.

LiveUpdate Pro is great in its supporting role as a feature of Symantec's utilities. But it doesn't have the right stuff to play a lead part.

Oil Change

\$29.95 a year. Network Associates Inc., Santa Clara, CA; 800-492-2700; www.mcafee.com.

● One of the spoils of Network Associates' takeover of CyberMedia, Oil Change is a software update service. In lieu of a browser-based interface, Oil



Change provides its own application.

After using a wizard interface to register with the service, you click on the program's Start button to download a current list of updates, and the program then scans your disk for applications it can update.

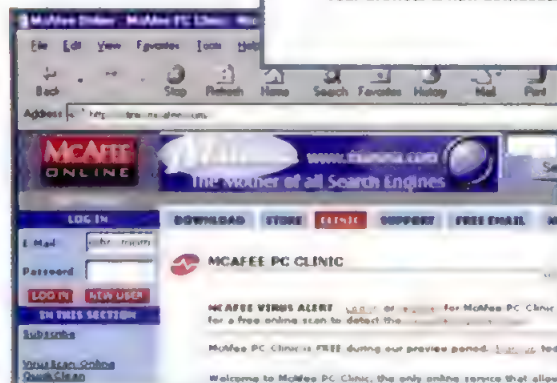
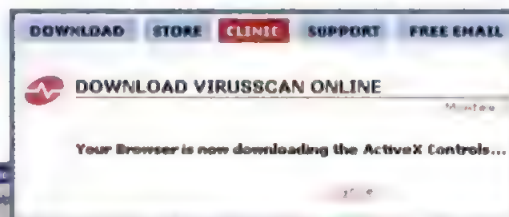
Like LiveUpdate Pro, Oil Change ran into some difficulties on our tests. The package failed to scan our system with total accuracy and didn't offer the latest upgrades. For example, it offered to update with old versions of Netscape Navigator and AOL Instant Messenger. Worse, it mistakenly identified Adobe Acrobat 3.02 as Version 3.0 and offered to upgrade it to Version 3.01.

Given that many applications, including Microsoft Windows, now offer built-in updates, a standalone update service has to do a great job to justify its price tag. Oil Change doesn't meet that test. **PC**

HOW TO USE AN ONLINE VIRUS SCANNER

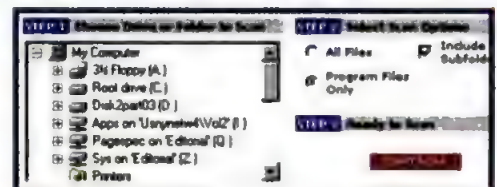
By taking advantage of technologies such as ActiveX, utilities vendors can provide many of the same features online that are usually found in software. In this example, we used McAfee Clinic to scan a folder on our hard disk for viruses.

1 TO START, point your browser to www.mcafee.com and log on to the service.



2 ONCE YOU SELECT

VirusScan Online, McAfee Clinic automatically downloads the required ActiveX control and opens VirusScan—if you're using IE. If you're using Navigator, you must first download a Java applet.



3 YOU CAN THEN SELECT the drives and folders that you'd like

to scan for viruses. Click the Start Scan button to initiate the process.



4 VIRUSSCAN ONLINE REPORTS on its progress. If it detects a

virus, you can choose whether to disinfect it or delete the file.

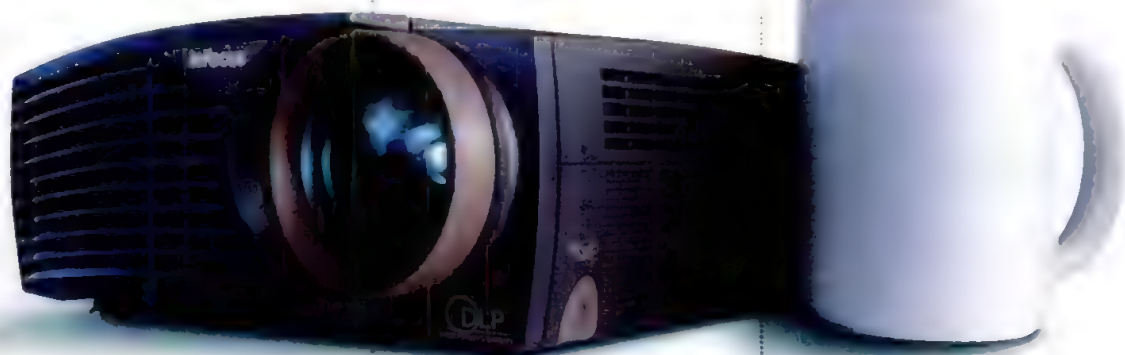


If a 6.8 pound projector can influence the entire computer industry, imagine what it can do for your meetings.

Why would PC Magazine rank a humble projector company among the ranks of Intel, Microsoft, and the other most influential companies in the computer industry? Good question. They said

of projectors like our revolutionary new 6.8 pound personal series—the ones that earned In Focus an Editors' Choice Award and made us the only projector company on the list. Our personal projectors are so small and

projectors for conference rooms and fixed installations, too. So for projectors that are affordable, reliable, and just plain make you look great, there's really only one choice. The number-one



it's because In Focus is changing the way people use technology, more and more people are projecting from their laptop PCs, making the most of their meetings. They also said it's because

so bright, you can project with the lights on. They've become the preferred choice of people everywhere who present on the road. And we've got a full line of industry-leading

name in projectors—In Focus®. It's your image. Project yourself™. To arrange a free demo, simply call 1-800-294-6400. Or visit us at www.infocus.com/pcm

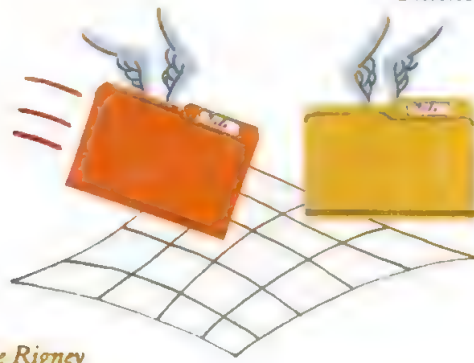


InFocus
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GET A SAFETY (INTER)NET

All reviews by Steve Rigney



The data that resides on your computer is important, and there is no reason to risk losing it. Some users back up their information using such devices as tape and optical drives, but most lack the hardware or software to perform regular backups. Online backup services, however, let anyone back up important files and in some cases entire systems via the Internet. Here we tested three services—@Backup, Connected Online Backup, and Internet FileZone Plus—that let subscribers back up data via the Internet to a remote server.

Transferring data requires bandwidth. And depending on the amount of data you must transfer, this can be quite time-consuming. That's why all three services use file compression, and two incorporate Delta technology (which copies only changed parts of files) to reduce the amount of data being transferred. Furthermore, two of these services, @Backup and Connected, maintain a repository of common software. So if you decide to back up your entire Windows 98 system, you don't have to transfer the OS, because it already exists on the backup server. Instead, the service will back up only your personal configuration settings.

The services also support varying degrees of automation. You can, for example, schedule your system to back up files while you sleep. And filters make it easy to select the right files without having to dig around your hard disk.

All things considered, backing up an entire system over standard phone lines is still quite intensive. But for the individual user who wants to back up important data, these products offer a great alternative. —Matthew Graven

@Backup

\$99 a year. @Backup Corp., San Diego; 800-400-9479; www.backup.com.

Like Internet FileZone Plus, @Backup is designed for individual users seeking to protect valuable data rather than to back up an entire hard disk. Though the service offers limited storage space, it supports such important features as scheduling and file versions, and lets you back up from more than one PC using a single subscription. Unfortunately, it lacks basic features, such as a Web- or Explorer-type interface.

One of the most straightforward subscriptions on the market, @Backup offers a basic, one-year plan of 100MB for \$99. You can add more space in increments starting at \$19.95 per month for 30MB extra. We

found the setup process extremely easy. We simply downloaded the install file, which is approximately 1.4MB, ran the installation, and filled out a form.

Unlike the FileZone Plus menu, @Backup's main menu doesn't let you drag and drop files to and from the server. Instead, you flag files as you do with Connected Online Backup and choose backup or restore. We liked the scheduling utility and the ability to use rules to customize backups. Unfortunately, @Backup doesn't provide many canned rules, so you must learn to design your own.

Unlike Connected Online Backup, @Backup doesn't automatically differentiate between application and data files. To back up files such as the Registry, you have to select them manually.

When performing a backup, @Backup requires as much as 5 percent of your disk drive for a staging ground. To ensure a speedy and secure transfer, all of the data is scanned using 2K-block-level Delta technology, compressed using PKWare's PKZip, and protected using double 56-bit encryption before it is transmitted.

Like Connected Online Backup, @Backup provides an existing library of common applications and operating systems stored on its server. Although most subscribers won't be able to back up their entire hard disk, this pool adds to the amount of data that can be restored if necessary.

	Member Rating		
	@Backup	Connected Online Backup	Internet FileZone Plus
Setup	Good	Excellent	Fair
Backup	Fair	Excellent	Good
Recovery	Good	Good	Excellent
Scheduling	Good	Excellent	Excellent

@Backup is hindered by limited backup space and a nonstandard interface. Whether you're looking to back up your entire hard disk or just important files, you'll find one of the other services in this review a better solution for your needs.

Connected Online Backup

\$19.95 for individuals, \$20 a month (minus volume discounts) for corporate users. Connected Corp., Framingham, MA; 888-922-2587, 508-270-0000; www.connected.com.



Although Connected Corp. is clearly courting corporate users, Connected Online Backup has capabilities that will also appeal to individuals and small business users. With a laundry list of features including support for full backups, incremental backups, point-in-time repair, and

automatic file selection, Connected can protect all the data, applications, and operating systems on a desktop or notebook PC. In fact, about the only thing missing from this product is a Web-based interface.

Connected is the most expensive service in this roundup, but unlike with Atrivia's Internet FileZone Plus and @Backup, there is no limit to the amount of data you can back up and retrieve. You can either sign up and download the software online (approximately 1.4MB), or sign up and order a floppy disk by phone. Also unlike @Backup and FileZone, Connected has a license limited to a single PC.

We found Connected extremely easy to install. In fact, it is the only product of these three that uses a wizard to set up basic backup information during the installation. For instance, the installation asks how often you want to back up and whether you want to perform a total disk backup or protect only data files.

Connected can differentiate among OS, application, and data files. This is useful for users who may not know whether a file is part of an application or data. Connected can also back up your configuration settings.

EDITORS' CHOICE

• Connected Online Backup



An online backup service should let you back up critical data quickly and securely while providing a full-featured client. Our Editors' Choice, Connected

Online Backup, does this while striking an excellent balance between power and ease.

In place of browser-based access, Connected opts for a proprietary client that provides a very intuitive, Explorer-like interface. Backup is simplified by scheduling features, file-type filters, and Connected's ability to differentiate between system and data files. It also supports Delta file transfers that send only a file's changed

data (a feature missing from @Backup) and compression to increase file-transfer speeds. And while your data is en route, it is secured by DES and triple DES encryption.

Unlike the other two services, Connected Online Backup's license limits your use to one PC, but Connected is the only service that offers unlimited server space. Therefore, if you have a fast LAN connection, Connected is a good choice for backing up your entire system, applications and all.

Several features are included to make file transfers smaller and faster, including a library of operating systems and applications stored on the backup servers. Connected also uses Delta technology and a proprietary algorithm to compress

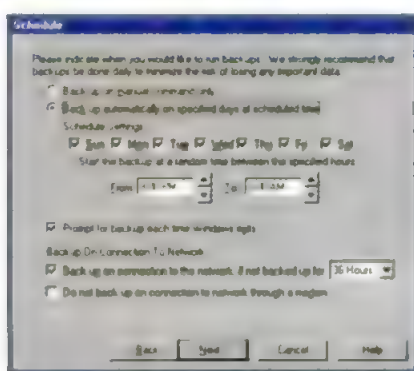
data. Meanwhile, Connected offers both DES and triple DES encryption to protect data en route.

Both a proprietary and an Explorer-like interface are available for selecting files to back up and recover. Like the other

HOW TO BACK UP ONLINE

There is no excuse for leaving important files at risk when backing up your data takes just four simple steps.

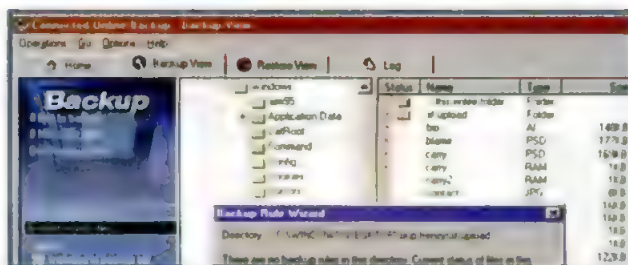
1 SETUP To begin using an online backup utility, first obtain the appropriate software and subscribe to the service. Once you install the Connected Online Backup client, it gives you a form to fill out and then displays a dialog box for setting up scheduled backups.



2 BACKUP Typically, the client will display your local files, letting you manually choose files

that you'd like to backup. With Connected, once you've selected all of the desired files, you just

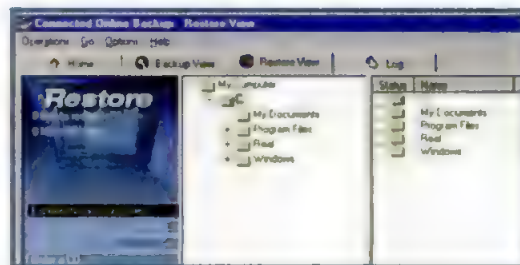
choose Backup Now, and the client prepares your files and transfers them to the backup server.



3 FILTER Along with scheduling, some services let you filter by file type and directory. This way, you can easily back up, for example, Word documents once a day, without sorting through a long list of files and selecting them by hand.



4 RESTORE Connected's Restore View tab displays all the files and directories located on the backup server. To restore data, you select files and directories on the server and choose Restore Now.



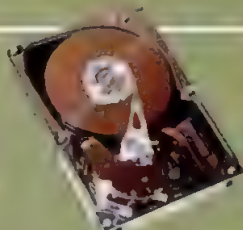
25 OF THE 25 TOP PERFORMING COMPUTER SYSTEMS USE SEAGATE DISC DRIVES.

HMMM, WITHOUT OVERTHINKING THINGS, IT LOOKS LIKE THERE'S
A STRONG CORRELATION BETWEEN HIGH PERFORMANCE COMPUTER
SYSTEMS AND HIGH PERFORMANCE SEAGATE DRIVES.

Have you heard of TPC? (AKA the Transaction Processing Performance Council.) Basically it's a highly professional non-profit group that tortures computer systems to the limits of performance to establish benchmarks. Recently, at TPC's grueling server trials, it turned out that every one of the top 25 highest performing servers used Seagate disc drives. Specifically Cheetah®, the world's fastest. Technically speaking, it was a slam dunk. This is important to know, because disc drives can account for up to 39% of the cost of a high performance server. Which is why, when all the top server brands wanted their money's worth, they chose Seagate. Who else?

FYI:  www.seagate.com/disc1
Find TPC at www.tpc.org

FYI



BARRACUDA 9LP & 10LP	BARRACUDA 10 & 35 & 50	CHEETAH 9LP & 10LP	CHEETAH 10 & 35
9.1 GB, F & 10.2 GB, F	10.2 GB, F & 36.4 GB, F & 50.1 GB, F	9.1 GB, F & 10.2 GB, F	10.2 GB, F & 36.4 GB, F
Ultra SCSI (9LP) Ultra2 SCSI Fibre Channel	Ultra SCSI (10) Ultra2 SCSI Fibre Channel	Ultra2 SCSI Fibre Channel	Ultra2 SCSI Fibre Channel
7,200	7,200	10,000	10,000

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Information the way you want it.

Online Backup

products, Connected includes a series of rules or filters to select files automatically. While we like the Explorer interface, we would like to also have a browser-based client and the ability to drag and drop files on the storage server—features currently found only in Atrivia's product.

Nonetheless, Connected Online Backup offers the most powerful and feature-rich solution in this roundup.

Internet FileZone Plus

100MB, \$9.99 a month; 1GB, \$14.99 a month. Atrivia Corp., Seattle; 888-287-4382, 206-749-8950, www.atrivia.com.

● Though it isn't intended for backing up entire hard disks, Internet FileZone Plus makes backing up important files an easy task. And since it has the only Web-based client in this roundup, you can easily access these files from virtually any system. FileZone Plus is also the only service in this roundup that supplies a split-screen window showing local and remote files, supports drag-and-drop backup and restore, and offers a virus scan utility. FileZone Plus lacks some fundamental features, however, including Delta file transfers.

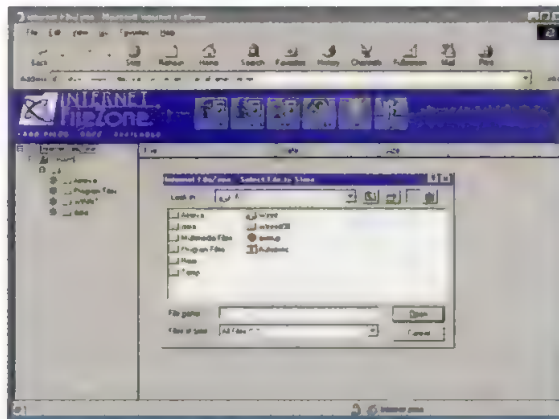
Uniquely, Atrivia offers a free FileZone account with 10MB of server space. The free service is a snap to use and works with almost any browser. FileZone Plus,

alternatively, is available for \$9.99 a month for 100MB of storage and \$14.99 for 1GB. If you prefer, you can sign up for an entire year and protect 1GB of data for \$149.99, which makes FileZone Plus the best yearly deal for large amounts of data.

Though FileZone Plus supports browser-based access, the Web front end

we called, we were put on hold for 20 minutes before a recording told us to leave a message. We received a call back about 30 minutes later.

FileZone Plus is useful for protecting only data files rather than an entire hard disk. Unlike @Backup and Connected, Atrivia doesn't keep a list of the most



Internet FileZone is the only product in this roundup with a Web-based interface.

does not let you schedule backups, back up multiple files, drag and drop files, or use filters to back up only certain types of files. Therefore, FileZone Plus includes a client utility that runs on any Windows 95/98- or Windows NT-based PC. To subscribe to FileZone Plus, we downloaded the install software, which is 1.8MB, and then had to call Atrivia to set up our account. Unfortunately, when

common operating systems and applications online to eliminate redundant data. Furthermore, FileZone Plus doesn't support Delta technology. It can, however, back up multiple versions of the same file, letting you restore data from a particular point in time.

Fortunately, FileZone Plus does provide compression and RSA RC2 encryption. For a staging area, FileZone Plus requires only about 2.5 times the size of the largest file you are backing up.

Though FileZone Plus isn't intended for backing up entire systems, its browser-based interface makes it an excellent choice for backing up and accessing files from anywhere at any time. **PG**

SOFTWARE SOLUTIONS

Traditional backup software continues to hold a large part of the market. These three popular products let you back up important data as well as your entire system to a local storage device.

Seagate Backup Exec offers manual and automated backups for Windows 95 and 98. Versions are available for other platforms including Windows NT and NetWare. With support for a host of devices including tape, CD-RW, Iomega Jaz, and optical drives, Backup Exec provides a variety of features to help you protect your data.

Backup Exec supports full and differential backups, and the AutoProtect feature can automatically sense which method to use. Meanwhile, the one button backup and restore lets you perform tasks with a single mouse click.

You can also selectively protect and restore individual files. And the Integrated Emergency Recovery can rebuild your entire system from scratch. (Seagate Software, Scotts Valley, CA; 888-732-2021; www.seagatesoftware.com.)

Another solution, **NovaBackup**, supports Windows 95 and

98, Windows NT, OS/2, and DOS. It can save to multiple devices including tape, CD-RW, and SyQuest SparQ drives.

Like Backup Exec, NovaBackup lets you schedule backups. The backups compress your data to save on storage space, while your data is automatically scanned for viruses and encrypted for security purposes. And also like Backup Exec, NovaBackup includes a disaster recovery utility. (NovaStor Corp., Simi Valley, CA; 805-579-6700; www.novastor.com.)

Taking a slightly different approach, **Tape-It** focuses on ease of use rather than breadth of features. As the name implies, Tape-It is designed for use with tape drives. When installed, this product adds an icon to your desktop that represents your tape drive. To back up a file, you simply drag and drop it onto the icon.

Tape-It also assigns a drive letter to your tape drive, making it directly accessible from within applications and Windows Explorer. Tape-It is available for Windows 95 and 98 as well as Windows 3.x. (PGSoft Inc., Pacific Grove, CA; 800-549-9001, 831-647-4833; www.pgsoft.com.)—MG

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64 MB SDRAM (expandable to 192 MB)	64 MB SDRAM (expandable to 192 MB)	64 MB SDRAM (expandable to 192 MB)
12.1" CTFT (800 x 600) Display	14.1" CTFT (1024 x 768) Display	14.1" CTFT (1024 x 768) Display
24X Max CD-ROM²	24X Max CD-ROM²	24X Max CD-ROM²
Compaq V.90 Data/Fax Modem³	Compaq V.90 Data/Fax Modem³	Compaq V.90 Data/Fax Modem³
Compaq PremierSound	Compaq PremierSound	Compaq PremierSound
Integrated AC Adapter; 1 Li-Ion Battery	Integrated AC Adapter; 1 Li-Ion Battery	Integrated AC Adapter; 2 Li-Ion Batteries
Microsoft® Windows® 98	Microsoft Windows 98	Microsoft Windows 98
Microsoft® Office 97 Small Business Edition®	Microsoft Office 97 Small Business Edition	Microsoft Office 97 Small Business Edition
Free* Trial of Compaq Online Services	Free* Trial of Compaq Online Services	Free* Trial of Compaq Online Services
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Lease For: \$75/month¹

Customize with these options:

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MultiBay Zip® Drive Upgrade: \$229

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Customize with these options:

DVD-ROM Drive Upgrade: \$199

Additional Li-Ion Battery: \$129

Compaq Value Case: \$49

\$3199*

Lease For: \$109/month¹

Customize with these options:

Microsoft Office Professional Upgrade: \$199

Additional Li-Ion Battery: \$129

Compaq Global Case: \$89

PROSIGNIA DESKTOP 310	PROSIGNIA DESKTOP 330	PROSIGNIA DESKTOP 330	PROSIGNIA SERVER 740
Intel® Celeron™ Processor 400/66 MHz	Intel Pentium III Processor 450/100 MHz	Intel Pentium III Processor 500/100 MHz	Intel Pentium II Processor 400 MHz
13.5 GB Ultra ATA Hard Drive¹	18 GB Ultra ATA Hard Drive¹	22.6 GB Ultra ATA Hard Drive¹	512 KB L2 Cache
64 MB SDRAM (expandable to 256 MB)	128 MB SDRAM (expandable to 384 MB)	128 MB SDRAM (expandable to 384 MB)	Dual Processor Capable
Compaq S700 17" Monitor (15.7" viewable)	Compaq S700 17" Monitor (15.7" viewable)	Compaq S900 19" Monitor (18" viewable)	64 MB SDRAM (expandable to 1 GB)
40X Max CD-ROM¹	40X Max CD-ROM¹/omega Zip Drive 100 MB	DVD-ROM G3	4.3 GB SCSI Hard Drive
Compaq 56K V.90 PCI Modem²	Compaq 10/100 Network Controller	Compaq 10/100 Network Controller	Max Internal Storage of 54.6 GB
Creative Labs SBS50 2-Piece Speakers	Altec Lansing ACS44 Speakers	Altec Lansing ACS44 Speakers	8 Bays, 4 Removable, 4 Hard Drive
STB/nVIDIA TNT, 3D AGP 16 MB	STB/nVIDIA TNT, 3D AGP 16 MB	Matrox Millennium G200 AGP 16 MB	32X Max CD-ROM
Microsoft Windows 98	Microsoft Windows 98	Microsoft Windows 98	1, 10, 100 TX UTP NIC
Microsoft Office 97 Small Business Edition	Microsoft Office 97 Small Business Edition	Microsoft Office 97 Small Business Edition	Server Management Software
Free* Trial of Compaq Online Services	Free* Trial of Compaq Online Services	Free* Trial of Compaq Online Services	Pre-Failure Warranty³ Memory, Drives, Processors
3-year Limited Warranty¹	3-year Limited Warranty¹	3-year Limited Warranty¹	3-year Limited Warranty¹

\$1489*

Lease For: \$51/month¹

Customize with these options:

Upgrade to S900 19" Monitor (18" viewable): \$200

Upgrade to Altec Lansing ACS44 Speakers: \$43

Add omega® Zip® Drive: \$79

\$2229*

Lease For: \$76/month¹

Customize with these options:

Upgrade to S900 19" Monitor (18" viewable): \$200

Upgrade to Microsoft Office Professional: \$199

Upgrade to Windows NT®: \$99

\$2779*

Lease For: \$95/month¹

Customize with these options:

Upgrade to V1000 21" Monitor (20" viewable): \$469

Upgrade to Microsoft Office Professional: \$199

Upgrade to Windows NT: \$99

\$2099*

Lease For: \$72/month¹

Customize with these options:

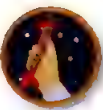
Upgrade to Intel Pentium III Processor 500 MHz: \$698

Upgrade to 9.1 GB Hard Drive: \$199

Preloaded Microsoft Windows NT and Novell NetWare operating systems available



*All prices shown are Compaq DirectPlus prices and are subject to change. Prices do not include applicable state and local sales tax or shipping to recipient's destination. ¹For hard drives, GB = billion bytes. ²24X Max CD-ROM data transfer rates may vary from 150 KB/s to 3600 KB/s; 32X Max CD-ROM data transfer rates may vary from 150 KB/s to 4800 KB/s; 40X Max CD-ROM data transfer rates may vary from 150 KB/s to 4800 KB/s. ³Designed only to allow faster downloads from K56flex-compliant sources. Maximum achievable download transmission rates currently do not reach 56 Kilobits per second (Kbps), and will vary with certain line conditions. ⁴Compaq Online Services: Free 30-day trial requires Internet access capability. ⁵Some restrictions and exclusions apply. Call (800) OK COMPAQ for warranty details. ⁶ITU V.90 modems are designed only to allow faster downloads from K56flex- or V.90-compliant digital sources. Maximum achievable download transmission rates are currently unknown, may not reach 56 Kbps, and will vary with line conditions. ⁷For storage, GB=billion bytes. ⁸Compaq Server Pre-Failure Warranty: Pre-Failure Warranty is available on all Compaq Prosignia servers using Compaq Insight Manager 2.1 or higher, also covers ECC memory, and server hard drives (except the 535 MB Fast-SCSI-2 hard drives) using Compaq IDA, IDA-2, Compaq SMART SCSI Array Controllers, Compaq SMART-2 SCSI Array Controllers, or SMART Array 3100ES Controllers. ⁹Leasing: Available through Compaq Capital Corporation to qualified businesses for a term of 36 months with a Fair Market Value purchase option, and is subject to approved credit and certain terms and conditions. Does not include taxes, fees, or shipping charges. ©1999 Compaq Computer Corporation. All rights reserved. Compaq, the Compaq Logo, and Prosignia are registered trademarks, PremierSound and MultiBay are trademarks, and DirectPlus is a registered service mark of Compaq Computer Corporation. Intel, the Intel Inside Logo, and Pentium are registered trademarks and Celeron is a trademark of Intel Corporation. Microsoft and Windows are registered trademarks of Microsoft Corporation. Other products mentioned herein may be trademarks or registered trademarks of their respective companies. Operating system pre-installed on all portable products. Compaq is not liable for editorial, pictorial, or typographical errors in this advertisement.



CLIP AND SAVE THE WEB

By Jan O'Connell



While pundits and philosophers duel to create catchy phrases defining the vast amount of raw data on the Internet (info glut, data smog, and so on), most of us struggle with a much more immediate problem: how to use this data most efficiently and effectively. Fortunately, an evolving group of software programs loosely called Web organizers is helping to resolve this problem—capturing, annotating, and storing Web pages and providing search engines to retrieve them. We tested all products using a particularly nasty group of pages, including Active Server Pages, ActiveX, DHTML, Java, and XML. Each vendor confirmed any failures we had trying to capture pages. Each product's organizational capabilities also play a significant role, because if you can't freely annotate, categorize, and retrieve your captured pages, you might as well print the stuff out. ☐

Flexible and instantly accessible, **SurfSaver** (\$29.95 direct) is a great digital filing cabinet for the fruits of your random Web surfing. It's also one of only two products in our roundup (CatchTheWeb being the other) that captured all the test pages we threw at it without any problems, and so we award it our Editors' Choice.

You access all SurfSaver functions by right clicking from within IE or Navigator, and the program automatically grabs the page as well as its title. It also lets you input keyword search terms and notes, and you can organize your data in folders.

Leveraging all the information you find is easy. You can search for pages by title, keywords, notes, URL, or date of capture, displaying all pages in your browser. You can't readily package the data you gather for transfer, but AskSam offers a network version (\$49.95 per user) with multiuser access that can help you share information within a company. (askSam Systems, www.surfsaver.com.)

If you're capturing data for presentation or to transfer to others, **CatchTheWeb** (\$39.95 direct) is for you. CTW is less functional for collecting nuggets from random surfing than SurfSaver, though, because projects must be open to save data to them.

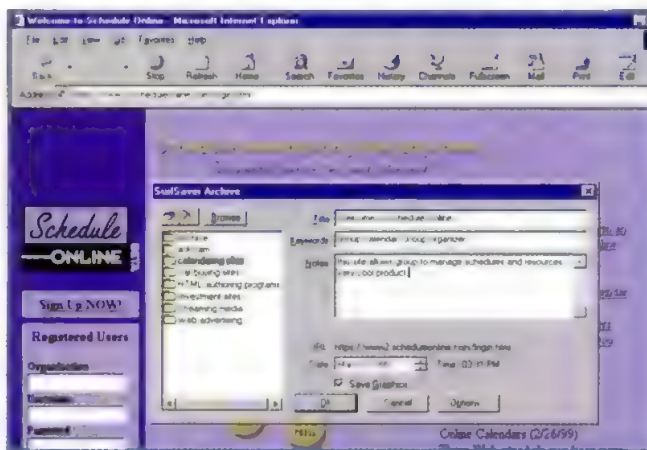
You use CTW by dragging a pushpin icon onto the desired page using Internet Explorer as your browser. This launches a dialog box for entering notes; URL and date of capture are recorded automatically. You have to use IE to work with CTW; no Navigator version is available or planned.

Working in CTW's four-panel inter-

ly creates an abstract and assigns keywords for each captured page; it can also periodically check for Web page updates. You store data in self-contained libraries that can be searched and shared and view data in a highly configurable Outlook-like interface.

But Organizer's toolbar-based interface, sitting at the bottom of the browser window, feels unnecessarily intrusive, and the product had difficulty capturing four of our test pages reliably. Add a \$79.95 price tag and you've got an impressive work in progress that's bested by more mature products like SurfSaver, which costs less than half the price. (Webforia, www.webforia.com.)

Hot Off The Web (\$29.95 direct) lets you annotate captured pages with a flashy collection of stickers, notes, and other annotations. The resulting file can be e-mailed as an attachment, which opens in the recipient's browser. Anticipate errors,



SurfSaver makes it easy to save pages and add notes. You can also index by keyword.

however, as HOTW failed to capture four of our test pages correctly in our testing. (Insight Development Corp., www.hotofftheweb.com.)

Netonizer (\$24.95 direct), which was state-of-the-art when

new back in 1996, is showing its age. A standalone application that operates independently of any browsers, Netonizer had difficulty working with several advanced sites and couldn't capture two of our test pages. (Strategic Information Technologies, www.sit-intl.com.)

Organizer (\$79.95 direct) automatical-

ly creates an abstract and assigns keywords for each captured page; it can also periodically check for Web page updates. You store data in self-contained libraries that can be searched and shared and view data in a highly configurable Outlook-like interface.

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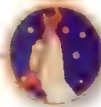
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INSTANT MESSAGING

By Alan Cohen



Home-run hitters weren't the only ones posting hefty numbers this past year. Instant-messaging services are booming, too: 29-million-plus users on ICQ and 16 million using AOL Instant Messenger make the services the McGwire and Sosa of IM. And the software is better than ever. Indeed, an instant-messaging package that is limited to instant messaging just won't cut it anymore. The best IM programs offer features that go far beyond the buddy list, providing a rich set of communications functions—including multiuser chat, e-mail notification, and file transfers. They also provide tight integration with online communities. You have to consider not just the software but also the community that comes with it. Without a standard for interoperable messaging, you need to persuade everyone you want to communicate with to use the same product you're using. We tested the most popular products, all of which are free. ☺

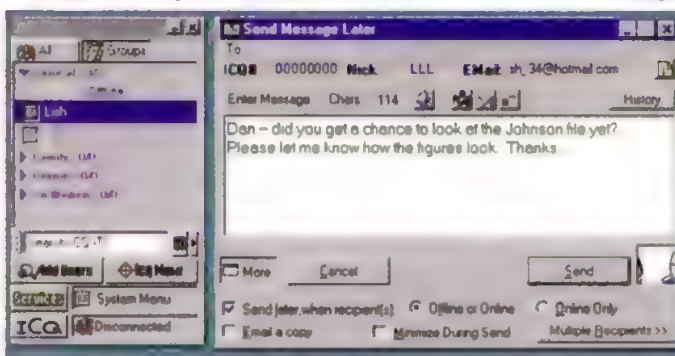
If Batman had a utility belt for cyberspace, it would look something like **ICQ, Version 99a**, our Editors' Choice, which has got a tool for everything. You can send and check e-mail, query search engines and software libraries directly from the buddy list, send voice messages, find random or specific chat partners, search archived instant messages, and create detailed user profiles that include photographs. Reminders are particularly handy, triggered not only at specified times but when select users come online.

And ICQ is smart. If a user is not online when you send a message, ICQ (like Yahoo! Pager) will let you send it anyway and make sure the other person gets it the moment he or she logs on. You can also compose messages while off-line yourself; ICQ will queue them up and send them later—a nice touch. And though many IM packages let you organize buddies into groups, only ICQ lets you send a message to all members simultaneously. We did have one gripe, however: ICQ's chat window is among the ugliest, with an IRC-style interface right out of the Pong school of design. (American Online Inc., www.icq.com.)

A clever integration with the Yahoo! portal makes **Yahoo! Pager** stand out. Pager

not only alerts you when mail arrives in your Yahoo! mailbox but also ties in with the site's customizable calendar, so you'll be reminded of upcoming events. Better yet are Pager's tabs for news, sports, and stocks. Click on these and check headlines and the status of your portfolio without ever leaving the instant-messaging client.

Pager is not perfect, however: It can't



ICQ lets you send messages to people off-line and has many other features.

send files, and to add buddies you must manually type user IDs from Yahoo!'s directory to your contact list; there's no handy button by which to add them, as with AOL Instant Messenger or ICQ. A Java version of the download client's fancy features, it provides quick access to your buddy list from any PC. (Yahoo! Inc., www.yahoo.com.)

For ease of use, **AOL Instant Messenger**

2.0 can't be beat. This is basic IM: one-to-one and multiuser chat, URL but no file transfers, and limited integration with AOL's portal (links to a customizable news page and to AOL's search engine). But the interface is intuitive and elegant, and adding and blocking users is a snap. If you can live without the bells and whistles, this is the IM client of choice. (America Online Inc., www.aol.com.)

We also looked at **PeopleLink** (PeopleLink Inc., www.peoplelink.com), **Ding** (Activeverse Inc., www.ding.com), and **PowWow** (Tribal Voice, www.powwow.com), but each of these proved somewhat buggy in our testing and was ultimately disappointing. PeopleLink, for example, failed to inform us when a chat partner left the room, letting us send messages into the lonely vacuum of cyberspace. Yet if a colleague is off-line, it will let you send a message to their e-mail address. Notably, PowWow lets you send voice messages, but group chat is a

bust: You'll see one large window, broken into a box for each participant. Users type in real time in their own windows. Trying to

follow the flow of the conversation is sort of like sitting at the UN without a headset.

Ding is a huge (about 8MB) download with a clunky user interface, but despite its unimpressive performance may be worth watching evolve. During our testing, it was acquired by CMGi—a significant investor in GeoCities and Lycos. CMGi plans to tie Ding features to the Web sites it's involved with. ☹



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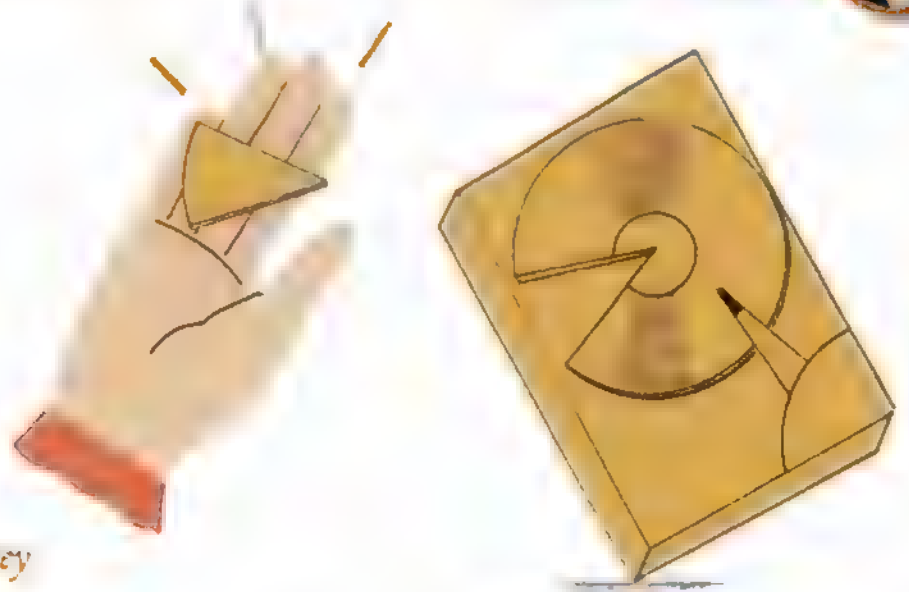
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DICE & DUPE DRIVES

Reviews by David Haskin and Steve Rigney



When it comes to hard disks, one size or shape doesn't fit all. In this section, we review two types of disk utilities—disk-partitioning and disk-imaging (or cloning) tools. Most new computers ship with a single, large partition. Disk-partitioning software lets you create new disk partitions without destroying all the data that's on your disk. Partitioning lets you organize data better, make more efficient use of disk space, and run multiple operating systems on a single PC. A disk-cloning tool lets you create a snapshot of an entire disk or partition, which you can then copy to another disk or one or more PCs. One of the key advantages of disk-cloning tools is multicasting, which lets you broadcast a single image to multiple PCs over a LAN or WAN. Individuals use disk-cloning software, but it is also a popular solution for corporations, resellers, PC configuration centers—even testing labs such as PC Magazine Labs.—*John Morris*

DISK PARTITIONING

EZ-Drive

\$20 street. MicroHouse International, Boulder, CO; 800-926-8299, 303-443-3388; www.microhouse.com.

● Although it does partition drives, EZ-Drive, Version 9.06, is really a niche product designed for a particular task: helping you properly install IDE hard disks on Windows 95 or 98 systems.

The program has a simple DOS interface that prompts you to select the physical drive and then specify the options you want, such as partition size. It then partitions and formats the drive as either FAT16 or FAT32. If your system's BIOS doesn't support large drives, EZ-Drive installs its proprietary EZ-BIOS, which does support them.

In case you are adding a second physical drive, EZ-Drive can copy the contents of an existing drive to the new one. In addition, it provides information about a variety of drives and how their jumpers should be positioned.

EZ-Drive is a great single-purpose tool for installing new hard disks. But it can't compete with general partitioning products such as PowerQuest Corp.'s PartitionMagic that specialize in changing the sizes and file systems of existing partitions.—*DH*

Partition Commander

\$50 street. V Communications Inc., San Jose, CA; 800-648-8266, 408-965-4000; www.v-com.com.

● A low-priced and simple partitioning solution, V Communications' Partition Commander targets individual users working on Windows 95 or 98. And like MicroHouse's EZ-Drive, Partition Commander is a DOS-only tool.

Partition Commander provides wizards to walk you through common disk-management tasks. Unfortunately, the wizards rarely finish the job for you. For example, one wizard improves system performance by creating a new partition dedicated to the Windows swap file but doesn't actually move the swap file to that new partition.

Partition Commander's Undo capability is another useful but incomplete feature. Because it has just one level of undo, the feature works only if you invoke it immediately after performing the operation. In fairness, no other disk-partitioning utility we tested offers even a single-level undo.

Though easy to use, Partition Commander (like EZ-Drive) supports only FAT16 and FAT32 partitions and not NTFS. It can assign to new partitions custom IDs for operating systems such as Linux, but it doesn't create partitions in

those OS file systems. And Partition Commander comes with a scaled-down version of V-Communication's System Commander, a utility for managing multiple operating systems on a single PC.

Lacking support for NTFS, Partition Commander won't appeal to power users. It is, however, a solid choice for less advanced users who want more control over their hard disks.—*DH*

PartitionMagic

\$70 street. PowerQuest Corp., Orem, UT; 800-379-2566, 801-437-8900; www.powerquest.com.



While a minimalist DOS version is still an option, PowerQuest Corp.'s PartitionMagic 4.0 is now a Windows utility with large, colorful icons for various tasks. But don't let its attractive interface fool you; PartitionMagic is nonetheless loaded with powerful features.

The product includes wizards for many tasks, including a wizard that prepares your system for a new OS, updates applications' drive references, and moves applications to different partitions.

PartitionMagic supports the widest array of file systems in this roundup, including Linux ext2, FAT16, FAT32, NTFS, and HPFS. And a batch mode lets you configure multiple changes to a hard disk and then apply them in a single step.

We recommend you approach the batch mode feature with caution. After loading PartitionMagic, we chose to resize the primary partition. After we clicked the Apply button, PartitionMagic resized the partition and then unexpectedly performed the 18 functions that we had chosen when getting acquainted with the program's interface. We'd prefer that the program ask for confirmation at each step.

The new BootMagic multi-OS manager is more powerful and simpler to use than

PartitionMagic's previous Boot Manager utility. Unfortunately, it doesn't offer user access control, an advanced feature found in Partition-It's multi-OS manager.

A few minor issues aside, PowerQuest's PartitionMagic 4.0 is the easiest, most powerful partitioning utility available.—DH

Quarterdeck Partition-It Extra Strength

\$59.95 list. Symantec Corp., Cupertino, CA; 800-441-7234; www.symantec.com.

● At one time, Partition-It was ahead of the competition with a native Windows application. But since Symantec Corp. acquired Partition-It, along with the rest of Quarterdeck Corp., the program has not been updated and is beginning to show its age.

Like PartitionMagic, Quarterdeck Partition-It Extra Strength 1.1 has wizards for core tasks such as creating and resizing partitions. But these wizards are merely help screens rather than true dialog boxes. Partition-It also comes with the Move-It utility, which moves programs from one partition to another, and the Select-It multi-OS manager.

Partition-It can create and resize FAT16 and FAT32 partitions and convert between them. But it doesn't support NTFS or

HPFS, let alone Linux. Both PowerQuest's PartitionMagic 4.0 and V Communications' Partition Commander support Linux.

During testing, Partition-It recognized a 6.1GB FAT32 partition but refused to perform any operations on it, reporting a hard disk write error. Symantec was unable to solve the problem, and Partition-It ran as expected on another test PC.

With the ability to control user access to partitions, Select-It is the most advanced of the *bundled* multi-OS utilities. Yet despite this and other useful features, Partition-It has fallen behind because it fails to support common file systems and lacks the interactive assistance you'll want when performing tricky disk management operations.—DH

DISK IMAGING

Drive Image

\$69.95 list per client. PowerQuest Corp., Orem, UT; 800-379-2566, 801-437-8900; www.powerquest.com.

● Setting a standard for ease of use, PowerQuest's Drive Image 2.0 includes powerful features such as SmartSector, resizing on the fly, hidden partitions, and support for removable media. In fact, its only shortcoming is not letting you multicast data across a network. But this important feature will be available in Version 3.0.

Like Symantec Corp.'s Norton Ghost, Drive Image includes a graphical interface that masks its DOS roots. After a very easy and quick installation, we clicked the Drive Image icon and were greeted by a graphical menu with buttons for creating and restoring an image, and for copying partitions between two hard disks. Wizards are provided to guide you through these tasks.

To increase the speed of an image backup, Drive Image provides a new compression algorithm and a technology called SmartSector, which lets you store only the sectors on the partitions that contain data. You can disable this feature, however, if you want to back up all sectors.

Drive Image offers several data-protection features. For example, we were able to password-protect our image files and hide a second partition containing a complete backup image of all primary partition data and applications. Drive Image performs a disk-integrity and sector scan when you create or restore your backup image.

PowerQuest's Drive Image 2.0 is a great choice for individuals or small businesses that do not need multicast capabilities.—SR

ImageCast IC3

100 seats, \$1,100 list. MicroHouse International Inc., Boulder, CO; 800-817-5119; www.imagecast.com.

● Designed for distributing images to hundreds of clients on a network, ImageCast IC3 offers powerful features including remote reboot, scheduled software distribution, monitoring, and an event log. It's also the only product in this roundup that can create images of applications, as well as entire partitions.

ImageCast includes a centralized network imaging utility and a standalone client. Both are fairly easy to install. The client is a DOS utility that like Norton Ghost and RapiDeploy requires you to reboot the PC before use.

The ImageCast network control panel is a wizard-based Windows utility for creating images that you want to multicast or distribute to all client PCs.

Before you can multicast the images, you must configure each client using either client boot floppy disks or the bundled ImageCast Remote Boot utility—a unique feature that remotely reboots the client PCs into ImageCast mode and performs the multicast. Once the files are dis-

PERFORMANCE TESTS

Disk Imaging



To determine how efficiently these disk-imaging products can transfer an image from one disk to another, we performed three tests. First, we measured the size of the disk image each product created (with compression set to *maximum*). Then we measured the time required to transfer this image to a single PC and to 16 PCs at once.

Symantec's Norton Ghost produced the smallest image, but all three products yielded better than 50 percent compression. More important, Ghost distributed this image to 16 PCs in just 2 minutes 58

seconds. On our single-client test, RapiDeploy was the fastest product.

Our client systems were Dell Dimension XPS Pro200n's, each with a 200-MHz Pentium Pro processors, 32MB of RAM, and a 2GB hard disks running Windows 95 OSR2. To distribute the image, we used a Compaq ProLiant 1600 server with dual 266-MHz Pentium II processors and 512MB of RAM, running Windows NT Server 4.0 SP 3. The clients and server were connected via TCP/IP (except in the case of RapiDeploy, for which we used IPX) on a 100-Mbps Ethernet network.—*Analysis written by Russ Iwanchuk*

Bold type denotes first place.

Choice	Compressed Image Size MB	Single-Client Distribution Minutes:seconds	Multiple-Client Distribution Minutes:seconds
ImageCast IC3	216	3:06	4:43*
Norton Ghost	199	2:45	2:58
RapiDeploy	209	2:30	3:58

← BETTER

* ImageCast can multicast to no more than 13 PCs; we tested the other products with 16 client PCs.

1. Start image editing software
2. Choose "file acquire"
3. Pre-scan page
4. Set scan area
5. Set resolution
6. Set scan mode
7. Scan page
8. Close TWAIN
9. Save file
10. Close image editing application
11. Start e-mail package
12. Start new message
13. Choose "attach file"
14. Locate saved file on hard disk

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a photo from their scanner.

How to do it
from ours.

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Let's face it, most scanners are not as simple
as they are supposed to be.

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billions of colors, and all the other
terms and specs don't make a bit of
difference when all you want to do is
e-mail a photo, scan a page of text into
your word-processor or any of the other
tasks you do countless times a day.



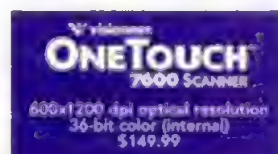
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**\$30 mail-in rebate with purchase of a OneTouch 5300 or \$129 rebate with purchase of a OneTouch 5300 and an HP CD-Writer (model 7200i or 8110i).

tributed, the control panel lets you reboot the PC again to start the operating system. Unlike Altiris's RapiDeploy, which works with both IP and IPX, ImageCast works only with the IP protocol.

In general, we gave RapiDeploy a slight edge for being the only product that lets you edit disk images before copying them to PCs. But ImageCast is a strong offering that has almost all the key ingredients.—SR

Norton Ghost

\$11 list per node. Symantec Corp., Cupertino, CA; 800-441-7234, 408-253-9600; www.symantec.com.

● By the time Symantec Corp. acquired Ghost from Binary Research, the product already had a loyal following. In addition to creating and resizing disk partitions automatically, Norton Ghost supports multicasting, individual file recovery, and the ability to save images on removable media. Ghost is also the only product in this roundup that can handle image files larger than 2GB.

The software includes both DOS and Windows utilities for creating images and storing them locally or on a remote server. Like Altiris's RapiDeploy, Ghost requires that you create boot disks for all of the clients to which you want to broadcast images. Unlike RapiDeploy and MicroHouse International's ImageCast IC3, Ghost forced us to locate all the necessary drivers manually for creating the boot disks.

Ghost also doesn't let you automatically configure the clients' settings, such as IP address, from the central console. To do this, you must run the GhostWalker utility on the client PC. In addition to IP, Ghost supports NetBIOS, but not IPX.

Though a network connection is the best way to copy an image file, you may not always be near a LAN. As an alternative, Ghost lets you transfer an image using a parallel-port connection.

Ghost is a reliable product that delivers good performance, but competitors offer more innovative features.—SR

RapiDeploy

25 users, \$315 list. Altiris Inc. (part of KeyLabs Inc.), Linden, UT; 888-252-5551, 801-226-8500; www.altiris.com.



Designed to help network administrators quickly deploy a static image to multiple PCs, Altiris's RapiDeploy is a versatile product that also lets you

KEEP IT ZIPPED

No system should be without a file compression utility, commonly known as a ZIP manager. There are many ZIP managers on the market. WinZip 7.0, one of the most popular downloads of any kind, is easy to use and includes all the key features. For completely transparent management of ZIP files, try Mijenix's innovative ZipMagic 98.—Edward Mendelson

Drag and Zip 3.0

\$25 online. Canyon Software, San Rafael, CA; 800-656-5443; www.canyonsw.com

This is a well-designed ZIP manager with a file-viewing feature, drag-and-drop compatibility with Windows Explorer, and an optional wizard interface. Drag and Zip can convert ZIP archives into self-extracting archives. It has built-in support for ARC, ARJ, BinHex, GZ, MIME, TAR, UUE, and XXE formats, plus a freeware add-on for LHZ. And it includes a browser plug-in.

PKZip for Windows 2.6

\$29 online, \$39 disk. PKWare Inc., Brown Deer, WI; 414-354-8699; www.pkware.com

The original ZIP manager, PKZip has been updated for Windows but still employs a customizable, spreadsheet-style interface for viewing and testing ZIP files and converting them to self-extracting archives. It also includes an optional wizard interface. One of PKZip's strengths is compatibility with older ZIP managers. It supports BinHex, GZ, MIME, TAR, UUE, and XXE.

TurboZip 3.0

\$49.95 online. Pacific Gold Coast Corp., Locust Valley, NY; 800-732-3002, 516-759-3011; www.turbozip.com

A full-featured ZIP manager, TurboZip 3.0 has a Windows Explorer-style interface with a built-in file viewer. Backups can be automated using any Windows scheduling program. TurboZip supports ARJ, BinHex, CAB, GZ, LHZ, MIME, TAR, TGZ, UUE, and Z.



WinZip 7.0

\$29 online. Nico Mak Computing, Mansfield, CT; 877-724-4600 (orders only);

www.winzip.com.

The most polished of the traditional ZIP managers (as opposed to ZipMagic), WinZip lets you

drag and drop files in to and out of archives. Like Drag and Zip, WinZip has a checkout feature. It also has a similar install feature, which extracts setup files and places them in a temporary folder until you install the applications. A separate bundled utility creates self-extracting archives. It has built-in support for BinHex, CAB, GZ, MIME, TAR, UUE, and XXE. Freeware add-ons (not included) add support for ARC, ARJ, and LZH, as well as browser-based compression.

Zip-It 4.0

\$50 street. Symantec Corp., Cupertino, CA; 800-441-7234; www.symantec.com

Last updated in 1997, Zip-It offers a traditional spreadsheet-style interface with drag-and-drop capabilities. The built-in file viewer cannot display long filenames, and the read-me file suggests switching to QuickView instead. Archives can be converted to self-extracting executables from within the program; browser plug-ins support online ZIP viewing and extraction. Zip-It also supports ARC, GZ, and LHZ.



ZipMagic 98

\$40 street. Mijenix Corp., Boulder, CO; 800-645-3649, 303-245-8000; www.mijenix.com

With ZipMagic 98, Windows treats ZIP archives as ordinary folders. The only catch is that some utilities, such as uninstallers, can get confused by ZIP archives that don't behave like regular archives, so you sometimes have to configure ZipMagic manually to function smoothly. It also includes browser plug-ins for viewing ZIP files online, a traditional ZIP manager interface, and a choice of a wizard interface or right-click support for all standard ZIP operations. It supports ARC, ARJ, ARK, BinHex, CAB, DWG, GZ, LHA/LZH, MIME, PAC, PAK, RAR, TAR, UUE, Z, and ZOO.

resize partitions, back up and restore image files, and most important, edit image files before distributing them.

RapiDeploy consists of several components including a management console, client configuration agent, and client-imaging agent. All of the components run as 32-bit Windows applications, with the exception of the DOS-based imaging agent.

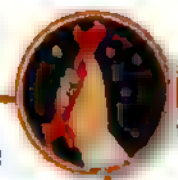
Like the other products we tested (except PowerQuest Corp.'s Drive Image 2.0), RapiDeploy supports multicasting of images to upgrade or set up remote PCs over a LAN. RapiDeploy works with both the IPX- and IP-based networks. We found the product fairly easy to install—especially using the built-in wizards.

Our favorite of RapiDeploy's features was the product's ability to edit the col-

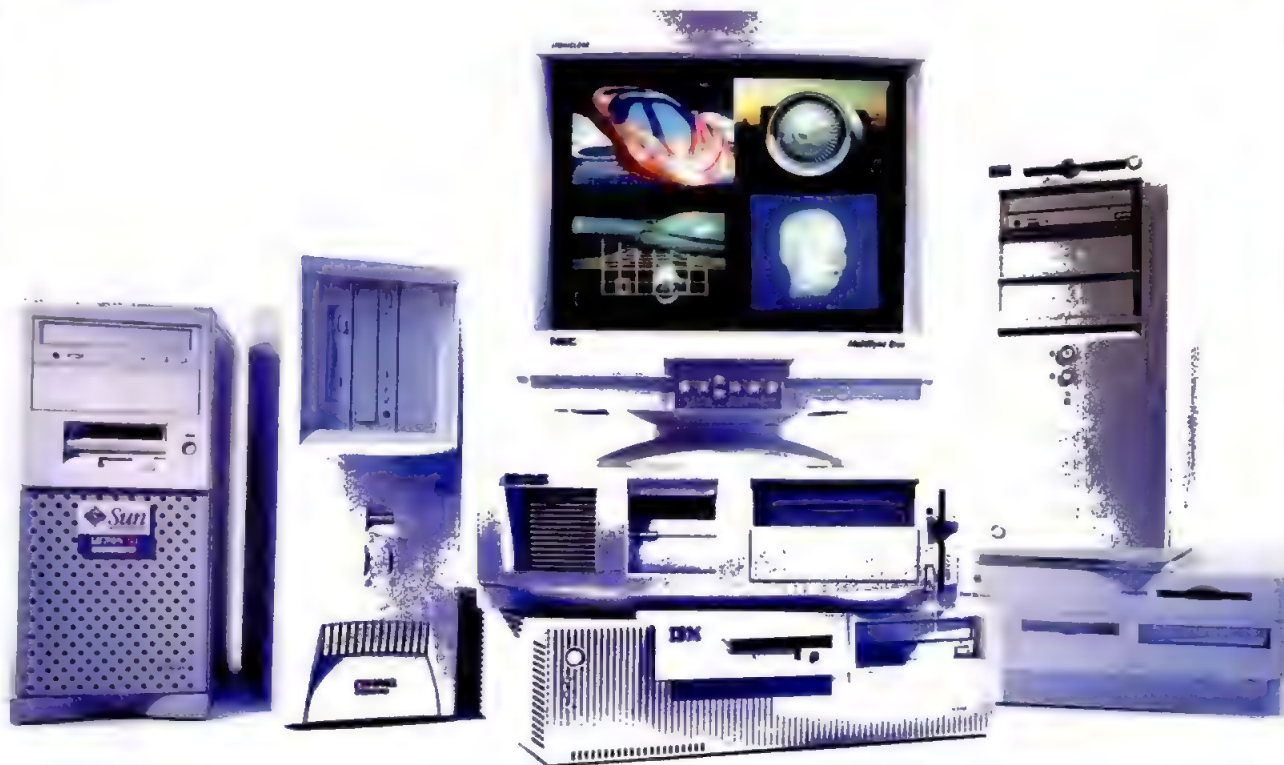
lected image files to change the configurations. After sending an image file to the server, we were able to use the management console on the server to change settings, such as IP address and computer name. We then broadcast the file back to the client, and the client configuration agent immediately made the changes.

As do the other products, RapiDeploy requires a boot disk to deploy an image to a client PC. Fortunately, RapiDeploy includes a wizard that helps you create the boot disk by walking you through the steps required.

About the only thing missing from RapiDeploy is a remote boot utility—a feature ImageCast provides. That feature, however, is available in Altiris's higher-end product, LabExpert.—SR



NEC



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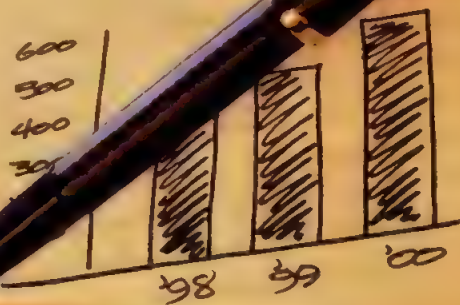
If you're looking for a new system, remember, the monitor is the component you'll be interacting with most. So why not go with one that sets the standard for screen performance in any environment and for all applications? MultiSync from NEC Technologies, Inc.

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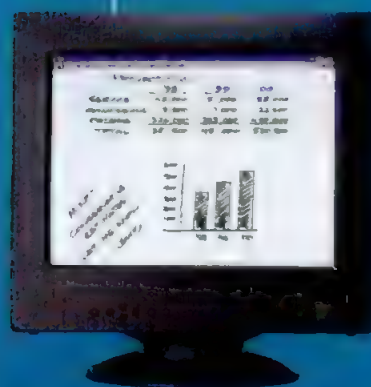
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PROJECT	181	222	500
	<u>'98</u>	<u>51,000</u>	<u>22,000</u>
SERVICE	42,000	17,000	45,000
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ORDERS	<u>326,000</u>	<u>451,000</u>	
TOTAL	381,500		



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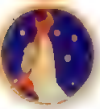
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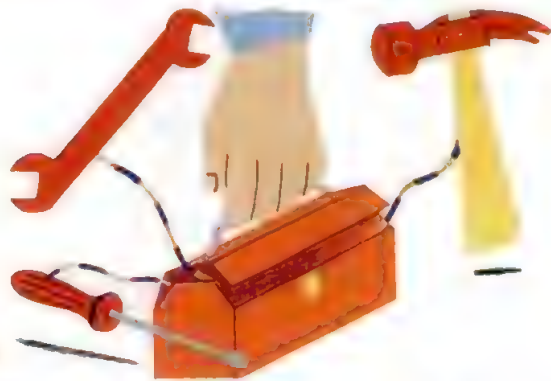
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ESSENTIAL NT UTILITIES

By Jeremy Moskowitz



Windows NT Workstation is a pretty complicated place. With a system this complex, things can go wrong. When they do, there's a class of utilities out there for troubleshooting a PC running Windows NT Workstation and keeping it operating at peak performance. Sometimes all your system needs is a little tune-up. For that, there are several disk defragmentation tools on the market designed specifically for Windows NT's file system. Other times, it's human error that causes Windows NT Workstation to sputter. Just as Windows 95 and 98 have diagnostics tools with enhanced Recycle Bins, so does Windows NT. Of course, these tools solve basic problems. More serious issues arise if, for example, you install a new device driver that causes a system conflict. These situations call for more powerful troubleshooting utilities such as BlueSave, ERD Commander, and NTFS-DOS and NTFS-DOS Tools. No matter what the cause of your Windows NT Workstation woes, a fix is out there. ☐

BlueSave

\$99 list. Winternals Software, Austin, TX; 512-330-9130, ext. 10; www.winternals.com.

● Just about everyone has experienced the dreaded Windows Blue Screen of Death (BSOD), but no one can predict when that particular terror will strike. Although Windows NT has the ability to capture the contents of the memory that was in use when the system actually failed, surprisingly it doesn't save the most essential piece of information for troubleshooting: the actual text of the BSOD message. That's where Winternals' BlueSave comes in.

Once you install it, you won't even know that BlueSave is running until the bomb hits. When that happens, simply reboot the system and use your favorite text viewer to open the Bluescrn.txt file, which you'll find sitting in the directory where you installed Windows NT. If your system doesn't come up after a reboot, you'll need an additional tool (see the reviews of ERD Commander and NTFS-DOS in this story) to access the file from the hard disk. Once you've retrieved the text file, you can send it to your administrator or Microsoft support to determine what caused the problem.

Diskeeper for Windows NT Workstation

\$50 street. Executive Software International Inc., Glendale, CA; 800-829-6468; www.execsoft.com.

● Disk fragmentation is not unique to the Windows 95/98 world, yet none of the disk defragmentation tools we reviewed in the story "Tune Up Your PC" are compatible with Windows NT. Because Windows NT uses its own file system, NTFS, it requires special disk utilities such as Diskeeper 4.0 for Windows NT Workstation.

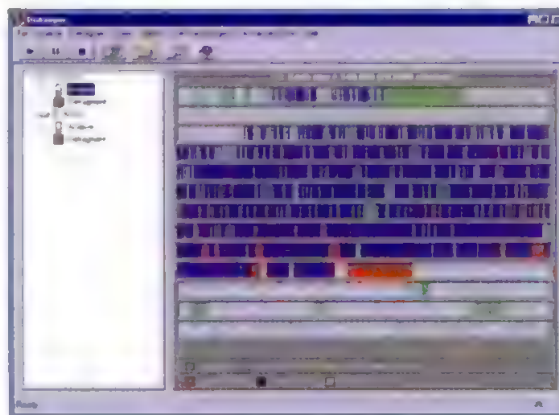
Disk fragmentation occurs when related bits of data are scattered throughout different areas of the disk. Telltale

signs that your disk has become fragmented include exceptionally long boot times or slow access to files. Diskeeper solves the problem in essentially the same manner as a Windows 95 or 98 defrag utility, packing all the related data in one area of the hard disk where the computer can find it faster.

The first time Diskeeper is launched, it analyzes your system and tells you how fragmented the disk has become. You must perform at least one disk defrag session manually; after that, you can "set it and forget it" using Diskeeper's built-in scheduler.

The schedule can be set up in practically any configuration of hours, days, and runtimes—even to run continuously. Since system performance decreases during disk defragmentation, it's best to defragment during the lowest system usage. Setting the defragmenter to run every day at midnight is usually sufficient. Only the most powerful systems should run Diskeeper in continuous mode.

Diskeeper is available in two versions: a lite version, which is free, and a commercial version. The major difference is that the commercial version can defrag in the background while you work on other tasks. Of course, if you are extremely diligent about running the defragmenter manually,



Diskeeper does disk defragmentation for Windows NT Workstation.

you may be able to get away with the free version. But most users will be better off spending the money for the full-featured version.

Disk defragmentation isn't the most exciting chore, but Diskeeper can make it painless and help you get the most performance out of Windows NT.

ERD Commander

\$249 list. Winternals Software, Austin, TX; 512-330-9130, ext. 10; www.winternals.com.

● If your Windows NT system is experiencing a major malfunction because of a misplaced, misbehaving, or miscreant file and a simple file rename doesn't do the trick (see the review of NTFSDOS Tools in this section), you need a more powerful set of tools to repair the problem. Winternals' ERD Commander is just what you need. This suite offers a broad set of tools—copy, rename, mkdir, view files, attribute set, and remove directory, to name a few—that can be invaluable when the chips are down.

To get access to the ERD shell, you first need to modify the three boot floppy disks used to install or repair Windows NT. When you run the ERD Commander setup program, you'll be prompted for the Windows NT CD-ROM and either three blank disks or copies of the original boot disks for the operating system. If you have only blank disks, ERD Commander fires up Windows NT's own boot disk creator (`winnt32.exe/ox`). It takes only a minute or two to write the ERD Commander code to the first two disks.

When disaster strikes, simply pop in the floppy disks as directed. Instead of Windows NT's normal installation/recovery screen, you'll see a text-based shell where NTFS and FAT volumes can be freely manipulated and repaired on a file-by-file level.

The most powerful ERD Commander feature is its Access command. This command grants the Everyone group access to all files in the directory of your choice. This command is particularly useful when NTFS permissions are removed from critical Windows NT system files, leaving the OS in an unusable and unbootable state.

At \$249, ERD Commander is a high-priced product to have waiting in the wings. But when an emergency arises, you'll be glad to have it on hand.

NTFSDOS Tools

\$89 list. Winternals Software, Austin, TX; 512-330-9130, ext. 10; www.winternals.com.

● NTFS, the native file system for Windows NT, offers many advantages over Windows 95's FAT, including faster access times, higher security, and increased reliability. Unfortunately, once you leave the

FAT world behind, you can't simply boot with a DOS disk and expect to access and manipulate the files on your NTFS disks. Additionally, if your machine is in a dual-boot configuration, it is impossible to see the NTFS partitions while running Windows 95/98.

But with Winternals' NTFSDOS Tools, these problems disappear. Simply copy the NTFSDOS.exe file onto a regular DOS or Windows 95/98 boot disk and voilà!: instant access to NTFS from DOS or Windows 95/98.

The free NTFSDOS lets you read and copy most files from your NTFS partition to other non-NTFS disks, such as floppy disks or FAT partitions on your hard disks. It also comes with a Windows 95/98 VXD file, which improves system stability when your system is reading NTFS volumes while running Windows 95 or 98. If you copy the VXD file to your Windows\System directory and to run NTFS-

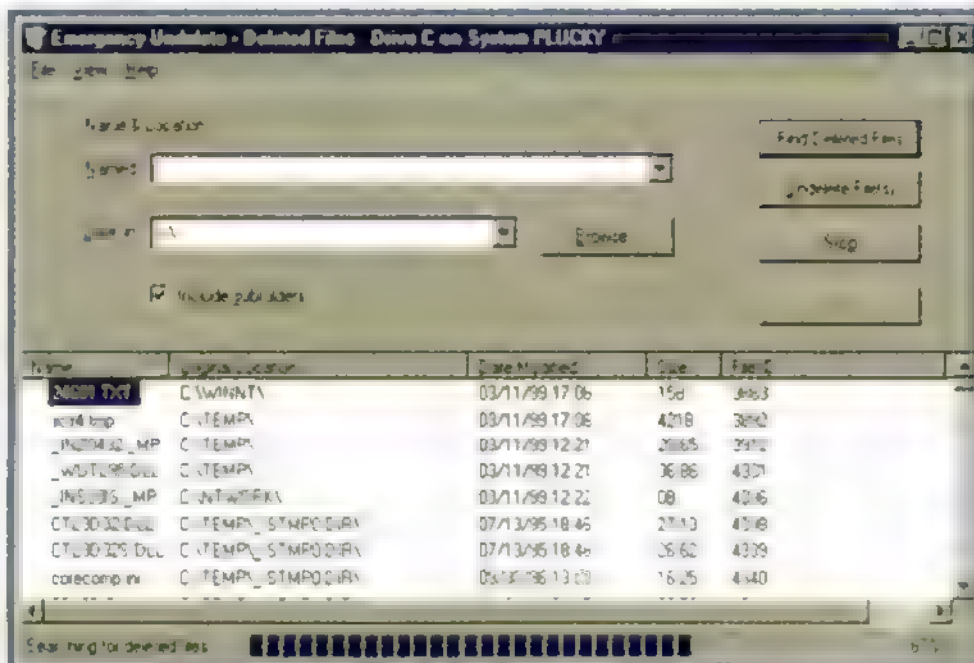
you can't choose the name; NTFSRen chooses a random but similar filename. Once a file is renamed, you can't change the name back, so this is a tool that should be handled with caution.

NTFSDOS Tools doesn't provide nearly as many rich features as the more advanced ERD Commander, which has its own bootable shell. But when you're in a real pinch, this collection of tools can unlock NTFS.

Undelete for Windows NT Workstation

\$50 street. Executive Software International Inc., Glendale, CA; 800-829-6468; www.execsoft.com.

● The Windows NT Recycle Bin is pretty good for recovering files that you've deleted while working in Windows applications. But if you delete a file from within the command shell or suddenly realize that you need a file after emptying the



Undelete lets you bring files back from the brink with a standard search dialog box.

Recycle Bin, you're out of luck. That is, unless you have Executive Software's Undelete 1.2 for Windows NT Workstation.

Undelete has two modes: Emergency and Normal. The Emergency mode can help you recover

a file if you deleted it before installing Undelete. To minimize the chances of overwriting the file, Undelete Emergency installs a mere 8K of Registry data to the hard disk, and then runs from the CD to recover a lost file.

The commercial product, NTFSDOS Tools, includes NTFSDOS plus two add-ons that provide limited write capabilities to the now-visible NTFS volumes. NTFSCopy enables one copy of a file to overwrite another. This is useful, for instance, if a device driver is corrupt and you want to replace it. The only caveat is that the byte count must match exactly.

The second utility, NTFSRen, lets you rename an NTFS file from Windows 95 or 98. This feature can be helpful if you've added a new device driver that is preventing Windows from starting up. Sometimes, by renaming the driver you can fool Windows NT into thinking it is missing, and the OS will skip over it and continue the normal startup. The only catch is that

er a file if you deleted it before installing Undelete. To minimize the chances of overwriting the file, Undelete Emergency installs a mere 8K of Registry data to the hard disk, and then runs from the CD to recover a lost file.

The Emergency Undelete has a Search dialog box that looks similar to Windows NT's Find Files or Folders. Simply enter the search pattern of the deleted files (for example, *.doc) and all the matching deleted files show up as possible selections. Click a file to recover it, then hit the Undelete File button.

If there's no emergency, choose Normal mode, which lets you install the full product rather than running off the CD. This adds additional functionality to the Recycle Bin, which lets you undelete a file anytime you've accidentally removed it. **PC**

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 - Emerging data-intensive applications like those exploiting imaging and multimedia capabilities become available and affordable,
 - Corporate client/server environments blossom into enterprisewide networks serving as infrastructure for such applications as SAP/R3, PeopleSoft, BAAN, Oracle and customer information systems. As Windows NT and Unix servers supporting these applications proliferate, the amount of information in need of safe, reliable storage soars.
- By 2001, it's expected that some 245,000 terabytes of information will require storage on Unix systems, while NT systems are expected to generate 350,000 terabytes of data by then. In fact, the amount of data stored is growing by 100% per year.
- Meanwhile, average disk drive capacity keeps climbing with each passing year. In 1997, according to the 1998 DISK/TREND Report, more two- to three-gigabyte drives were shipped than any other type. A year later, three- to five-gigabyte drives led shipments. By 2001, the preferred drives will each deliver 20 to 40 gigabytes of storage.



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Figuring out which data storage products are most reliable can be difficult. Conflicting claims from competing manufacturers cite mean-time-between-failure (MTBF) measurements or annualized-failure-rates (AFR). When it comes to newly introduced products, these numbers are predictions based on product testing. So it's worth paying attention to the vendors' rigorous tests.

Prior to introducing a product, Quantum performs extensive testing under strenuous conditions at both product and component levels to determine the most accurate MTBF. For instance, Quantum designed the DLTtape™ system to operate at a complete duty cycle. Unlike other vendors who test their products at only a 10% duty cycle, Quantum does not quantify reliability figures at duty cycles as low as 10%. Why not? Because such a light usage reliability test is seldom relevant in the mission-critical applications for which the DLTtape system was designed.

In addition, during a product's lifecycle, Quantum revises its

Silicon Gaming Bets on Quantum Drives

Silicon Gaming of Palo Alto, California, is poised to revolutionize the \$17 billion slot machine market with Quantum Viking™ hard drives. The company's new generation of slot machines incorporate the latest sound, live-action, and video technology to create a whole new gaming experience. The Pentium-based Odyssey machines have 26-inch video display touchscreens, 64 megabytes (MB) of RAM, and 4 gigabyte (GB) Quantum Viking hard drives.

"We had to address pretty tough demands for capacity and speed," comments Silicon Gaming Director of Marketing Katie Bolich. "Plus, the need for round-the-clock reliability in this market is poised against the stresses of constant play, tugging handles, spilled drinks, pounding buttons, and living in a smoke-filled environment that's pretty hostile to electronics. But even more important, after the technical specs have been met, is the sales support we get with Quantum. At this phase of our development, we have to know our key vendors are behind us with more than just great products. A major part of Quantum's value to us is that support."



University Guards Researchers' Work with DLTape™ System

Approximately 80 graduate students and professors in the University of New Hampshire's Computer Science Department carry out research into subjects like "parallel processing over distributed networks" and "artificial intelligence constraint satisfaction." This original research would be virtually impossible to recreate if it was lost, so researchers rely on the department's computing support staff and DLTape™ technology to preserve their work.

"The purchase of the Quantum DLTape™ 4000 tape system was met with sighs of relief," recalls Andy Evans, Computer Specialist and System Manager at the university. "It started working right out of the box." Before choosing a DLTape 4000 for backup and recovery, the Computer Science Department used a pair of 8mm DAT (digital audio tape) systems in a backup process that Evans calls 'painful.'

"One of the biggest problems with DAT backup tapes was data recovery, and DLTape technology made that possible. I was looking for ease of use, speed, and reliability. The DLTape system provides that and more."

MTBF measurement based on an ever-expanding database of actual field data.

Getting what you need from tape drives and libraries

The demands of doing business non-stop has fueled an enormous need for better, more cost-effective tape backup, archival and near-online solutions that deliver affordable higher capacity and performance as well as data integrity.

Today's backup solutions must shorten run times and boost the amounts of data to be backed up during fixed time periods. They must run without operator intervention, offer the highest levels of reliability and durability, and incorporate comprehensive error-detection and correction so errors and equipment-replacement costs can be minimized.

Quantum's DLTape technology delivers both the capacity and high performance demanded by today's data-intensive applications. An industrial-strength solution, DLTape offers exceptional durability and data integrity along with the ability to grow easily

with changing business needs.

DLTape technology outperforms 8-mm helical scan solutions by a factor of three, offering three times the capacity and read/write heads that last five times as long, thanks to features that minimize head and media wear. Quantum's DLTape leadership derives from a half-inch cartridge design, multi-channel recording capability, firmware excellence and sophisticated error-detection and correction methods.

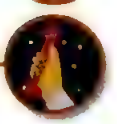
The DLTape system has earned its superior reputation through customer satisfaction, and continues to lead the industry with an MTBF of over 200,000 hours at 100% duty cycle coupled with a demonstrated low AFR.

Because so many IT organizations demand Quantum's DLTape systems, all major computer and tape library vendors now offer it to meet their customers' needs.

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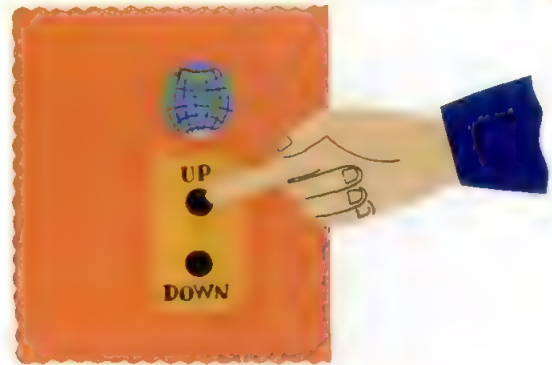
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GOING UP, GOING DOWN

By Larry Seltzer



The Web has changed a lot over the past few years, but the main way to send and receive files between computers on the Internet remains the same: *File Transfer Protocol*, or FTP. Web site builders frequently use FTP clients to send the HTML and other files that make up a site to the server. Also, software companies such as Netscape maintain FTP servers for users to find and obtain software. We tested each product against Windows NT and Linux FTP servers, plus several popular public sites such as Microsoft.com and ZDNet. All the programs we review handle the basic file management tasks that are at the core of any FTP utility. The differences arise in advanced features and the interface you work in. If you need to use FTP only occasionally, then you don't need anything more than your browser's FTP capability. But if you need more, check these out. ☺

The most complete array of features and the slickest user interface give **WS_FTP Pro 6.0** (\$37.50 direct) our Editors' Choice nod in this mature market. Whereas the classic FTP interface typically features two panes at the top of the screen for your local and remote servers and maybe a log window at the bottom, WS_FTP's Windows shell extension lets you use Windows Explorer to view both FTP sites and the WS_FTP folder structures. Being able to work within a familiar interface like Explorer for your FTP tasks is refreshing, and a big advantage, especially if you're a less-experienced user. If you don't want to add another Windows shell extension, you can use the classic WS_FTP program interface.

In case you have complicated or repetitive tasks to perform, WS_FTP's scripting utility and scheduling facilities make it easy for you to automate updates of servers without lots of drudge work. This makes tasks such as posting files to a Web server easier than the rest. (Ipswitch Inc., www.ipswitch.com.)

If you post files to your Web site on a regular basis and want to automate or schedule the process, **FTP Control 3.0 Pro** (\$29 direct) is a strong solution. In fact, FTP Control is a better product than

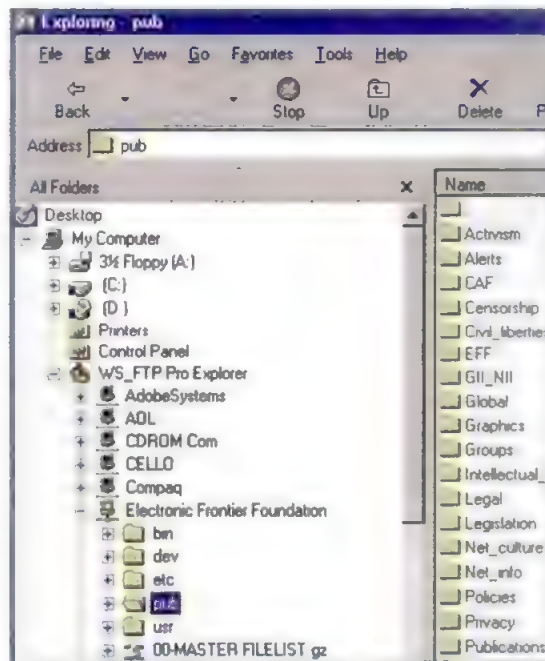
WS_FTP for automating tasks. Its full-featured scripting language has more sophisticated control structures and library routines than WS_FTP offers. TransSoft also provides 30 sample scripts demonstrating the features of the language. The scripting language isn't needed to automate most transfers.

FTP Control also offers a neat inter-

face feature that only it and CuteFTP share, known as The Hat (CuteFTP calls it the Queue). The Hat is a good way of queuing FTP requests. You can select files from around a remote download site and put them in The Hat, and as you leave for lunch or home, just tell The Hat to retrieve them for you while you're away. (TransSoft Ltd., www.fipcontrol.com.)

Cute FTP (\$34.95 direct) handles the basics and also offers a fine queuing feature like The Hat but lacks the more sophisticated scripting and automation features that distinguish FTP Control and WS_FTP. In lieu of a scripting feature, Cute FTP lets you create macros to record and play back regular transfers. (Global-Scape Inc., www.globalscape.com.)

Our favorite last year was **BulletProof FTP** (\$29.95 direct). This year's Version 1.10 remains a good product, but its lack of a scripting facility relegates it to a



WS_FTP provides you with the familiar Windows Explorer interface.

back position. The utility has satisfactory proxy support and can import site lists from text files or WS_FTP installations. (BulletProof Software, www.bpftp.com.)

There's something appealing about the simplicity of **Cupertino, Version 1999-01-22** (free download). Cupertino has all the core features for a client but none of the fancier automation. In an interesting departure, Cupertino has no installation program; just run the executable file and it makes a data file with all the settings. (Sean Hu, members.xoom.com/seanhu.) ☺



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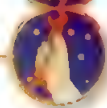
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MAKE NET WORK, NOT PLAY

By Sarah L. Roberts-Witt



Giving your employees Internet access can be both the best thing and the worst thing for your company's productivity. We test five products that make the Internet a tool, not a time waster. These products provide the power to block and or screen Web sites, and they provide reports on Internet activity.

Internet Day Trading Soars
—CBS News

ESPN's Web Traffic at Work Up
20 Percent —Media Metrix report

Live Victoria's Secret Show
Jams Web Site —The New York Times

These headlines all crossed our desks while we were testing products for this story. The question you must ask yourself is, Did your company's employees get the news through the media, or were they the newsmakers?

The Internet—these days, companies can't live without it. But the Web contains a lot more information than is relevant to our jobs. Corporations, as well as libraries, schools, and any Web kiosk operator, are grappling with how to provide Internet access while avoiding the potential legal and productivity pitfalls that come with it. Regardless of the type of organization, networked Internet content-filtering and monitoring software, such as the five packages we review here, is the primary tool used to walk this precarious line.

For businesses, the decision of whether to block is a sticky one. Although prohibiting pornography and hate speech is a no-brainer (not doing so can leave corporations vulnerable to possible sexual harassment and discrimina-

tion suits), companies are also concerned with the effect of unlimited surfing on productivity.

For those companies that think they should restrain employees from vacation planning or portfolio checking, these products include features to block those types of activities. These so-called productivity filters can weed out, say, sports and travel sites, to let companies decide for themselves which surfing is useful and which isn't.

To help companies define their filters, these products list sites that the vendors deem inappropriate because of pornographic images or hate speech, or because they aren't job-related. These lists are divided into categories; corporations can choose which types of content employees will not be allowed to access.

Because the crown jewel of each product is the list of URLs it has amassed, corporations that purchase the monitoring tool cannot view it directly. Rather, if a company finds a site that it doesn't want to block, it can override the product's list. Similarly, companies running any of these products can add a site to the list if the site is accessible but the company wants it blocked. Each purchase price includes a one-year subscription to the vendor's list updates, which can be downloaded manually and sometimes automatically.

These products also let companies set different types of access based on time of day and day of the week. CyberPatrol, Little Brother, and SurfWatch go a step farther, letting companies set different

levels of access for different user groups; this way, R & D can be given freer rein than the sales department.

In a logical extension, many corporations are developing acceptable-usage policies to clarify their positions on Internet access with a written document that each employee signs acknowledging that such access is being closely monitored and that certain sites will be blocked. The document also usually details the disciplinary action that will accompany violations. Both LittleBrother and WebSense include sample acceptable-usage policies to help you craft your own.

The software packages in this roundup have matured as the demand for them has increased—and in more ways than the addition of productivity categories. First, the number of sites that each product lets you potentially filter has mushroomed. WebSense, for example, boasted a then record-breaking 60,000 sites on its restricted list when we reviewed it two years ago ("Surveying the Wave," *PC Magazine* Network Edition, May 6, 1997); that number now exceeds 500,000. In sharp contrast with our previous experience, all the databases include both the URLs and IP addresses of blocked sites, making them more bulletproof.

Another big change concerns hardware requirements. Previously, most corporate filtering and monitoring products had to run on a server separate from the one running your network. But now, with the exception of LittleBrother, each has adopted a plug-in model. We tested the Microsoft Proxy Server for Windows NT plug-ins of CyberPatrol, SmartFilter, SurfWatch, and WebSense. These products are available on several other platforms as well, including CheckPoint Firewall-1 and Netscape Proxy Server.

Reporting utilities have also vastly

improved. Except for CyberPatrol, all the products we tested come with canned reports that offer a surprisingly granular level of detail, so you can see how the Internet is being accessed and when.

All in all, these products delivered as advertised, though some do so with more panache than others. But the little yet essential extras, such as the ability to create different levels of access smoothly, are what may set them apart for you.

The Internet can be a boon or an albatross to your company. With some network intelligence and a fair access policy, you should be able to find a happy medium, making the Web work for your company and not against it.

Cyber Patrol for Microsoft Proxy Server

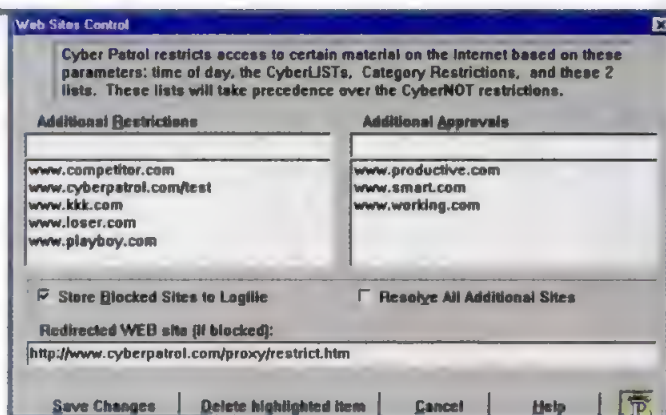
100 users, \$1,395 list. The Learning Company, Framingham, MA; 800-828-2608; www.cyberpatrol.com.

● One of two products in this roundup to come from the parental filtering market (along with SurfWatch@Work), The

You can customize which sites are approved and restricted with Cyber Patrol.

Learning Company's Cyber Patrol betrays a lack of understanding of the different needs of corporations. Cyber Patrol has no real coverage of nonoffensive (but not work-related) sites, and it performed poorly. Furthermore, the product is not designed for today's networks and has no reporting capabilities. These deficiencies put it well behind the competition.

Cyber Patrol's home market history is most evident in its database of restricted sites, the CyberNOT list. The list is divided into only 14 categories (compared with 27 for WebSense and SmartFilter), and these categories don't accurately reflect a corporation's needs in filtering employee



behavior effectively. Most companies are not interested in differentiating among partial nudity, full nudity, and sexual acts—three of Cyber Patrol's 14 categories. The only real productivity-related categories are Sports & Entertainment and Search Engines (which blocks access to all search engines).

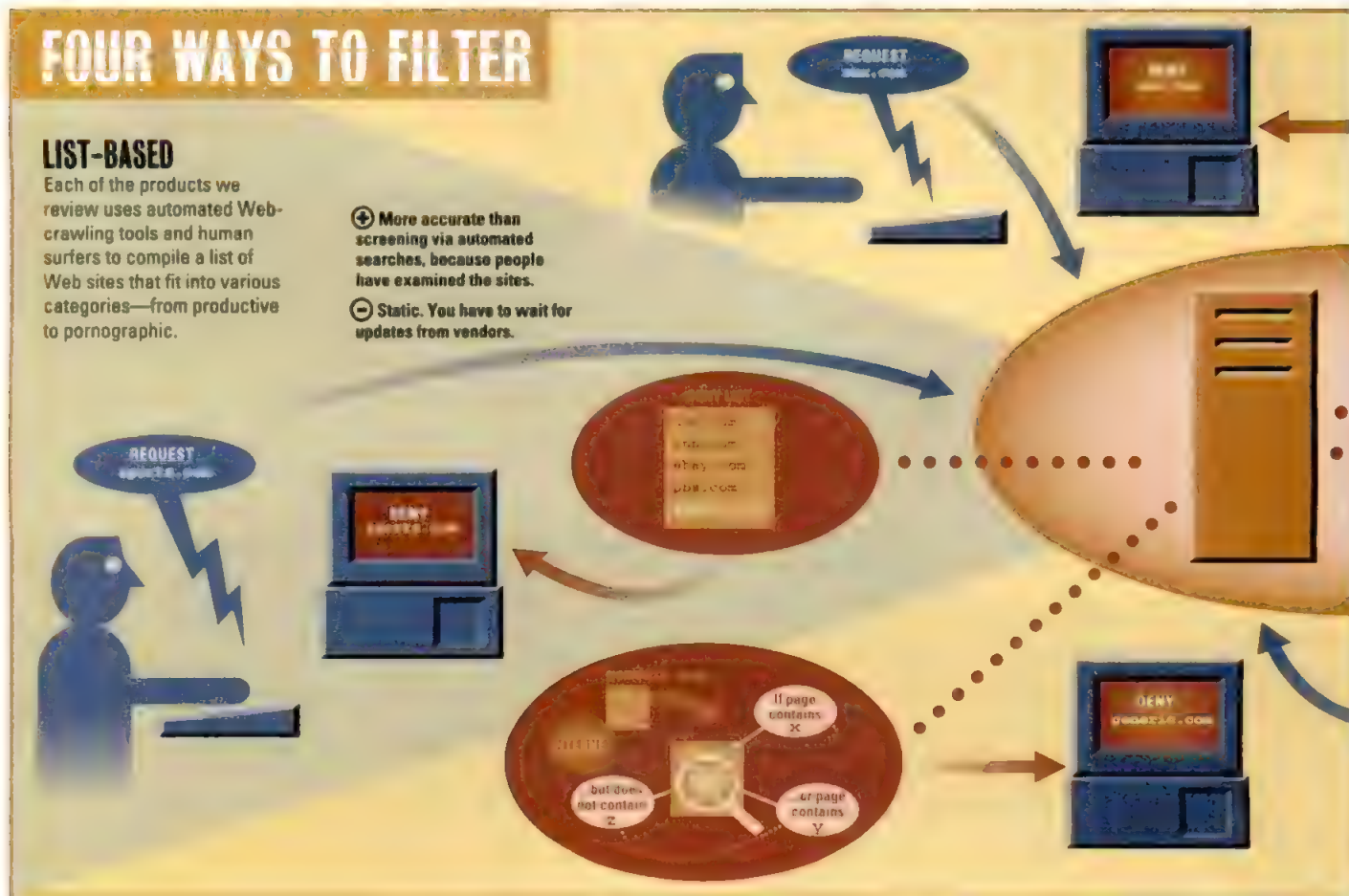
All this goes a long way toward explaining why Cyber Patrol didn't perform as well as any other product in this roundup in blocking the sites on our test

FOUR WAYS TO FILTER

LIST-BASED

Each of the products we review uses automated Web-crawling tools and human surfers to compile a list of Web sites that fit into various categories—from productive to pornographic.

- ⊕ More accurate than screening via automated searches, because people have examined the sites.
- ⊖ Static. You have to wait for updates from vendors.



list. Cyber Patrol didn't block any of the job-search sites we tossed its way and only stopped us from accessing two of the ten gaming sites we tried. Though it did much better in the pornography and hate-speech departments, the product still did not perform nearly as well as SmartFilter, SurfWatch, or WebSense. Cyber Patrol representatives say they are working on the productivity issue and plan to add more granularity to the categories as well as more sites to the database, the size of which they declined to comment on.

Another thing to be aware of is that the current version of Cyber Patrol may not run on your network. It's the only product we reviewed that works just with static IP addressing. So if you're using dynamic hosting configuration protocol (DHCP) servers within your network to handle IP addressing, you'll be out of luck with Cyber Patrol.

Cyber Patrol's one bright spot is its ability to filter access by group, a feature also available in LittleBrother and SurfWatch. But with this product, unlike with

EDITORS' CHOICE

• SurfWatch@Work



Trying to give employees the freedom they need to use the Internet productively, and at the same time, shielding them from its distractions is a tough

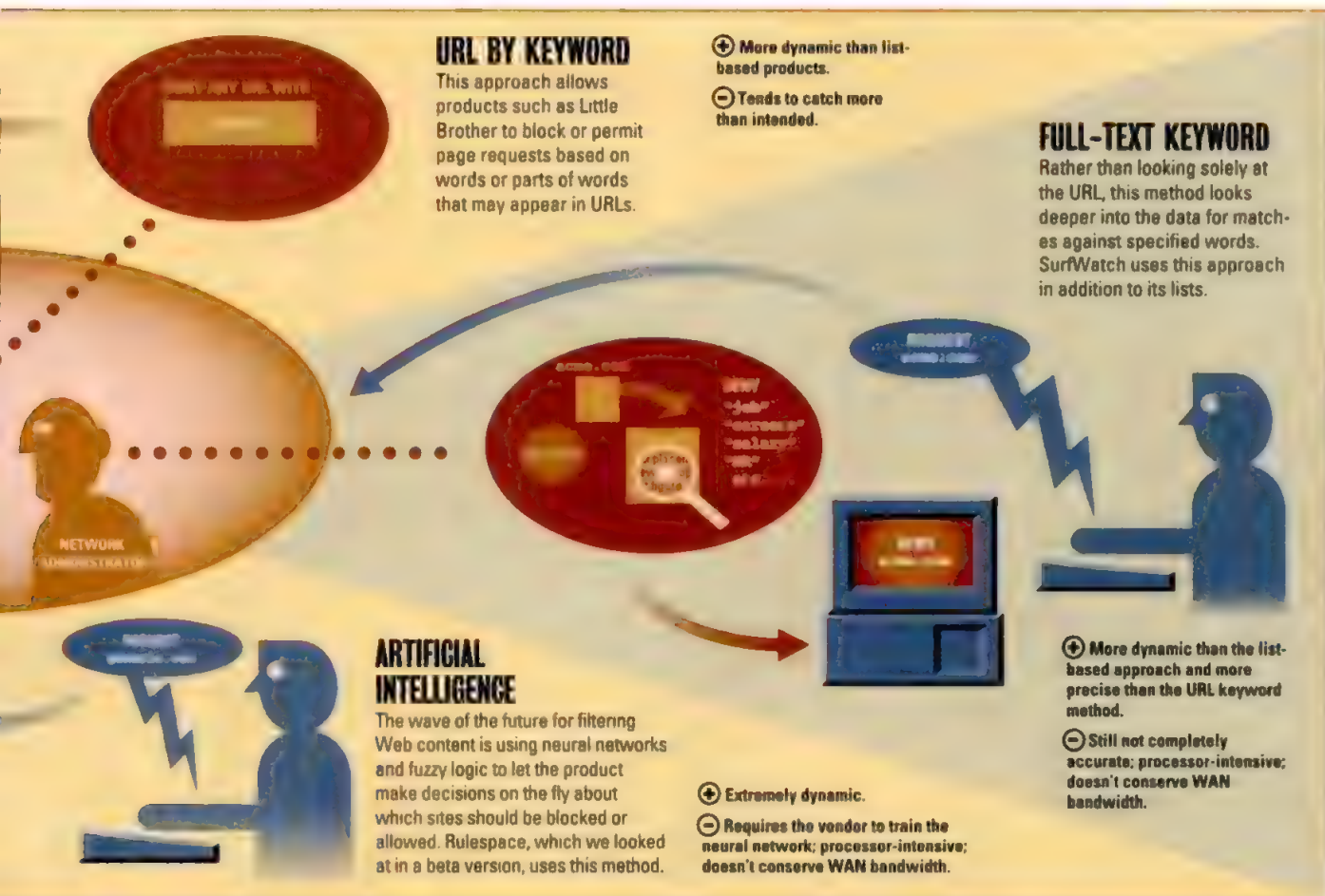
balancing act. It takes a sophisticated and capable product. SurfWatch@Work has an impressive administration module, strong reporting tools, and effective blocking that fills the bill and is our Editors' Choice.

SurfWatch is the only product here that ties directly into your preset Windows NT users and groups, saving tremendous time on creating filter sets and time restrictions. This gives you the power to craft a usage policy sensitive to the needs of each part of your organization, rather than a brute-force application of restrictions

on everyone.

Reporting is another strong suit. SurfWatch ships with more canned reports than any of its rivals, which can be easily exported for publishing.

For pure out-of-the-box site blocking, WebSense impressed us by catching everything on our tests. Its so-so reporting, lack of user groups, and administrative deficiencies limit its flexibility. If you're interested only in monitoring employee access, LittleBrother's the only product in this roundup that monitors in real time, and its reporting is the most powerful we saw.



SurfWatch, you have to create the groups from scratch by IP address.

In addition, you can configure Cyber Patrol to allow full unfiltered Internet access, no access, or filtered access. You can apply these options to the groups you create or to individual users. When scheduling access, you can set only two filters: one for work time and one for leisure time; you can't carve out periods such as lunch to give your employees freer access than during the rest of the day. You can manipulate the days and times of the day for each filter.

Another drawback with Cyber Patrol is its woeful reporting abilities. It is the only product in our roundup that doesn't ship with a reporting utility, though a third-party reporting tool will be bundled later this year. You can configure Cyber Patrol and Microsoft Proxy Server to store blocked log sites to the Windows NT event-log file and then run the free Cyber Patrol Site Scan against the log file or use a third-party tool.

Clearly, Cyber Patrol has some catching up to do to accommodate the needs of corporations. For now, go with SurfWatch or WebSense to meet your blocking and filtering needs.—SLRW

LittleBrother Pro

10 users, \$495 list. Kansmen Corp., Milpitas, CA; 800-200-9881, 408-263-9881; www.kansmen.com.

● Real-time monitoring of your employees' Web usage and the richness and variety of reports you can generate distinguish LittleBrother Pro 3.1 from its competition. But LittleBrother suffers from difficult user administration and a relatively weak filter list, making it a less complete solution than SurfWatch@Work.

Unlike the other products in this roundup, which are add-ons to the proxy server, LittleBrother is a standalone server built around network sniffer technology. So rather than intercepting every packet at the gateway like a proxy server, it simply scans the wire for traffic destined for the Web. This lets you monitor in real time and get constantly updated information on the management console in useful interactive reports. The problem with this method, though, is that if the hardware running LittleBrother crashes, employees will have unlimited access. If a proxy server



To test corporate filtering and monitoring utilities, we focused on two key areas: the ability to let administrators create and deploy a sophisticated, nuanced usage policy, and the quality and customization of each vendor's URL list.

To test list quality, we created a list of 100 URLs in nine categories and then tried to browse them through these products. The categories were astrology, games, hate speech, job search, news, pornography, shopping, sports, and travel. Note, however, that in the Scorecard below, we divide this list into two broad categories: inappropriate material (pornography and hate speech) and non-work-related sites (everything else). A product's score reflects the percentage of sites it blocked in each category.

To gauge the flexibility of each site's access policy, we populated our network with users and then tested how effectively

we could set usage restrictions. We considered whether you could create groups, which simplifies administration; the extent to which you can customize each product; how useful the customizations are; and how quickly and easily they can be done in the product's administrative console.

Time management is another important criterion that focuses on the degree to which administrators can control when their employees surf the Web. We set access restrictions by day and by time, evaluating both the effectiveness of the filters and the ease with which we could set them.

The final piece of the puzzle is the reporting tools for uncovering which sites employees are visiting, so you can modify your access policy accordingly. For products that had reporting tools, we tested how well and how easily the monitoring and blocking information could be presented.—Kevin Young

	CyberPatrol Proxy	Little Brother Pro	SmartFilter	Editors' Choice SurfWatch @Work	WebSense
SETUP					
Installation	Fair	Good	Good	Good	Good
Configuration	Fair	Fair	Good	Excellent	Good
PERFORMANCE					
Monitoring	Good	Excellent	Good	Good	Good
Filtering:					
Inappropriate material	Good	Good	Excellent	Good	Excellent
Non-work-related sites	Poor	Fair	Good	Good	Excellent
Tampering protection	Excellent	Good	Excellent	Excellent	Excellent
MANAGEMENT					
Scheduling	Poor	Good	Good	Excellent	Good
Ease of scheduling	Good	Good	Fair	Excellent	Good
List customization	Fair	Excellent	Fair	Excellent	Good
Ease of list customization	Good	Fair	Poor	Good	Good
Administration options	Good	Excellent	Fair	Excellent	Good
Ease of administration	Fair	Poor	Good	Good	Good
Reporting	N/A	Excellent	Good*	Good	Fair
Setting up reports	N/A	Good	Fair*	Excellent	Fair

N/A—Not applicable. The product does not have this feature. * Reporting features were not fully implemented in the version we reviewed.

solution crashes, no one will have Internet access.

LittleBrother's reporting data provides a lot of options, but you'll have to spend some time getting up to speed. The information can seem somewhat jumbled at first. To get to the good stuff, you have to double-click on much of the high-level summary information, whether you want it or not. Also, the time-line graphs don't make sense right away. But with a little training and a few mouse clicks, you can get what you want.

And what you get is very impressive. Not only can you track which sites employees have visited and for how long, but you can also monitor the amount of incoming and outgoing bandwidth. You can choose whether employees see that they are being monitored. This can all be accomplished without implementing any customized rules or groups.

Unfortunately, the product's monitoring and reporting strength doesn't translate into blocking prowess. Kans-



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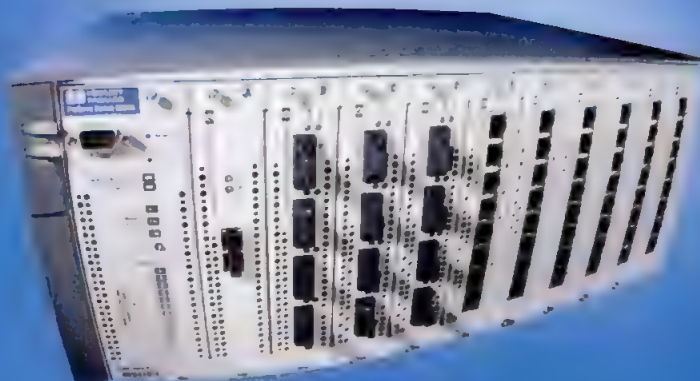
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**HEWLETT®
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men Corp. claims to have more than 500,000 sites in its list, but LittleBrother scored poorly on our tests. We were able to access sports and travel sites as well as some of the pornography sites we tried. We reviewed LittleBrother Pro, but Kansmen also offers a standard version (10 users, \$295 list) that includes only the unit's monitoring features.

As with SmartFilter and SurfWatch, you can block sites based on keywords that may appear in the heart of a URL. So if *job* is one of your restricted keywords, you'd block www.jobsites.com as well as any other site that had "job" as

SmartFilter for Microsoft Proxy Server

1,000 users, \$3,250 list. Secure Computing Corp., San Jose, CA; 800-379-4944; www.smartfilter.com.

● Although Secure Computing's SmartFilter 2.0 for Microsoft Proxy Server has powerful blocking capabilities, it makes you work much harder to put that power in place than the comparably effective SurfWatch@Work and WebSense. SmartFilter does offer some intriguing features, though, such as more access levels than just allowing or blocking sites. The company is in the process of fully integrating

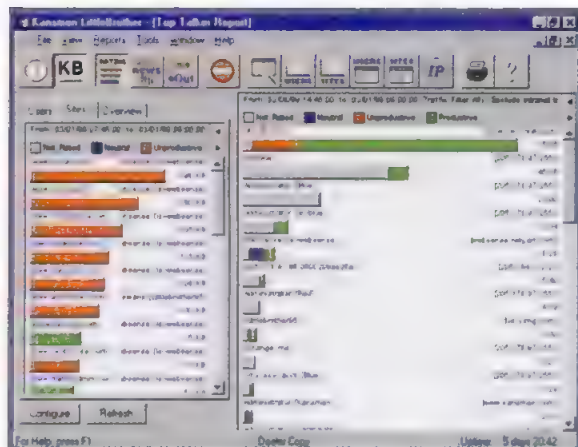
Administration options are also limited. SmartFilter doesn't currently support groups, so your only options are to control access for the company as a whole or by individual users (a group feature is reportedly coming). And without the ability to create filter sets, your only user customization options are to impose category-access rules on everyone or let individual users have access to the entire Internet.

We discovered other quirks that make SmartFilter harder to implement than its rivals. You can block search sites, but to do so you must also know the CGI parameter that triggers the actual search; simply blocking the URL won't work. The Help file provided this parameter for AltaVista but not for any other search sites.

You can set four levels of employee access, an interesting approach since most other products only let you allow or block particular categories. In addition to those two methods, you can *deprioritize* categories so that download times are slowed in increments ranging from 1 to 59 minutes. SmartFilter slows download times by processing all other server requests first. This is similar to SurfWatch's deprioritization but less elegant.

The fourth access level is known as coach usage. This means that the system informs an employee that he or she is trying to access a site that you'd rather they not, but then you let them access the site anyway. It's like coaching employees about what's allowed and what's not, and this is a novel approach to setting the parameters for them.

SmartFilter was in the process of implementing WaveCrest's reporting tool during our testing period. WaveCrest



After some training, LittleBrother's time-line graphs provide great information.

reporting and user groups—making SmartFilter a product to watch.

SmartFilter turned in the second-best performance in our roundup, nipping right at the heels of WebSense. But getting the product set up takes a lot of effort. CyberPatrol, SurfWatch, and Web-

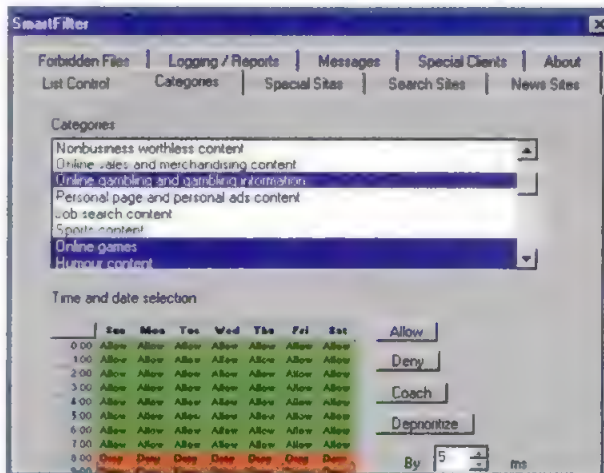
Sense let you click on the categories you want to block and create a filter set for employee access based on what you select.

SmartFilter, by contrast, forces you to create individual blocking rules for each of the 27 categories in its site database. You also have to define time-of-day and day-of-week access restrictions in the same category-by-category way. LittleBrother and SmartFilter share this irritating and time-consuming approach.

part of its name. This is a welcome feature, but it takes quite a bit of customization to repair leaks in the included site list.

LittleBrother also stumbles slightly in the area of user management. The problem is the way you assign filtering rules to users and groups. Each rule must be individually applied to a user or group, just as with SmartFilter. For example, if you want to block news-, porn-, and sports-site access, you must create three blocking rules and apply them individually. This problem is exacerbated by the product's limit of 30 rules. SurfWatch's approach, by which you group rules into categories such as "Block All Core Categories" and apply them in a single step, is much better.

LittleBrother is a capable monitoring tool, but it's not on a par with WebSense's blocking capabilities or SurfWatch's ease of administration to give you the total package.—Kevin Young



With 27 blocking categories, SmartFilter is highly customizable but time-consuming to set up.

comes with 13 canned reports, run manually or automatically, that let you zoom in on which categories are being accessed and which users are accessing them.

Though not polished to a fine hue, SmartFilter has a great deal of potential and more than holds its own on the blocking front. If you need the flexibility to provide different and finer levels of access to various segments of your orga-

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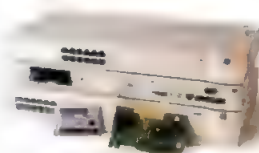
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nization, though, SurfWatch@Work and WebSense are better choices.—SLRW

SurfWatch@Work

50 users, \$995 list. SurfWatch Software Inc., division of Spyglass Inc., Los Altos, CA; 800-458-6600; www.surfwatch.com.



Sporting the smoothest, most intuitive interface of any product we reviewed, SurfWatch@Work is an administrator's dream. SurfWatch did a good job filtering material right out of the box; solid reporting and management flexibility make it the best overall solution for creating an intelligent Internet policy.

The main interface lets you access any portion of the product you need easily. It

has buttons with clear labels such as filter sets, advanced filtering, custom filters, and updates. Just one click takes you to the section; then you simply check boxes or enter appropriate text. Point and click, then just save your changes and go. SurfWatch also has excellent help files.

SurfWatch is far ahead of the competition in letting you set custom levels of access, thanks to its ability to import user groups directly from Windows NT's user domains. WebSense, by contrast, lets you customize access only by singular IP address. CyberPatrol lets access be blocked by group but doesn't tap into Windows NT's user domain; and SmartFilter offers the choice of only wide-open or filtered access to individual users. This makes SurfWatch much easier to manage than the

competition. For example, in addition to customizing the site categories you want blocked within each filter set, you can customize the access hours by user group.

SurfWatch also lets you deprioritize the amount of bandwidth by user group simply by reordering the group in the advanced filtering screen. So if one team is spending too much time on the Web, you can simply cut off the pipe there. SmartFilter also offers deprioritization—but only by blocking categories, not by user.

Reporting is one of SurfWatch's strengths. The 20 canned reports far outnumber the offerings of the other products we reviewed and were chock-full of great graphics options such as pie charts and bar graphs to convert the raw data

THE FUTURE OF INTERNET FILTERING

Corporate filtering and monitoring solutions rely on huge databases chock-full of naughty and unproductive sites. To compile these databases and keep them current, companies such as NetPartners Internet Solutions and SurfWatch have relied on a combination of automated and manual processes, including teams of what wiseacres refer to as smut surfers.

RuleSpace appears poised to render manual site gathering a thing of the past with its **RuleSpace Enterprise Suite**, a blocking/filtering product that relies on artificial intelligence.

Based on the findings of its in-house neural networks, which use a combination of proprietary fuzzy-logic and artificial-intelligence problem-solving methodologies, the RuleSpace Enterprise Suite can determine what is pornographic and what is not without the overhead and inherent limitations of a finite database. So when a user requests Playboy.com or even a freshly minted adult site, the product can block it simply by consulting the finely honed patterns—and not any site list.

At the simplest level, neural networks attempt to emulate the functions of the human brain in that they learn based on experience. In the case of RuleSpace, its neural networks are trained to understand the difference between a pornographic site and a health site, for instance, or between a site with an article about online gambling versus one that lets you gamble. These distinctions are made based on previous encounters with such material. Pornography and gambling are the only categories RuleSpace can currently block, but

others are slated to be added later this year.

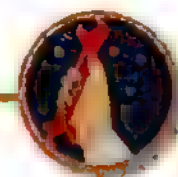
Though neural networks can get close, they will never understand all the nuances of phrasing and context. Unlike the human brain, though, neural networks can quickly process huge volumes of information, thanks to sophisticated algorithms and the widespread availability of powerful processors.

RuleSpace feeds its networks several thousand pages a day, and in the same way that a chess master can take a snapshot of a chessboard and determine the best move, the RuleSpace neural nets assess and categorize Web pages almost instantly.

But there are other technological limitations, such as *overtraining*. If a neural network understands too granular a level of information, it has trouble making classifications. RuleSpace engineers try to keep the neural nets at the optimal point on the learning curve.

Another challenge is that neural-networking technology has traditionally been text-based, making the processing of images and other media types impossible. To that end, RuleSpace is developing proprietary artificial-vision algorithms so the network can read and understand images.

RuleSpace needs to add more features and more topic categories to accommodate the needs of the corporate market adequately, but its efforts clearly signal the road ahead for how you'll ensure productive Internet usage in the future. (RuleSpace Inc., Portland, OR; 800-387-8373, 503-417-2900; www.rulespace.com.)—SLRW



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into a highly readable format.

SurfWatch's roots are as a consumer product for families to manage children's Internet access. This is evident when considering the database of restricted sites that makes up the heart of the product. It's partitioned into five core cate-

gories, including gambling, hate speech, pornography, and violence; and SurfWatch performed well on our tests in blocking sites that would fall within these topics.

Great charts and graphs put SurfWatch's reporting features at the head of its class.

The product also includes 16 productivity categories, including chat, job search, shopping, and travel, yet it didn't do as good a job as WebSense or SmartFilter in this arena.

Unique to SurfWatch is the ability to block or allow access based on keywords, such as *vacation*, *breast*, and the like—a terrific feature. SurfWatch scans Web

pages as they are being returned from the remote site to make sure that they don't contain the offending words on your list. If any page does, it blocks the whole page.

Though SurfWatch may not stop every site your employees try to access, its



design and interface are more intuitive and usable than those of the other products we reviewed. And the group filtering and reporting render it a product with the flexibility you need for creating an Internet usage policy.—SLRW

WebSense for Microsoft Proxy Server

1,000 users, \$5,000 list. NetPartners Internet Solutions Inc., San Diego; 800-723-1166, 619-505-3020; www.websense.com.

● The core competency of any corporate filtering product is to block sites that a company doesn't want its employees to visit. No product fulfills that mission more completely than WebSense for Microsoft Proxy Server 3.01, a blocking and filtering powerhouse from NetPartners Internet Solutions. But there's more to setting an Internet policy than blocking, and WebSense doesn't boast SurfWatch@Work's elegance of design or interface, nor does it support user groups.

No product handled blocking Web sites more effectively than WebSense. In fact, it was the only product in our roundup to block all the porn sites we tossed its way. There's no wonder to WebSense's blocking prowess when you consider the database currently boasts more than 500,000 site entries in 27 categories.

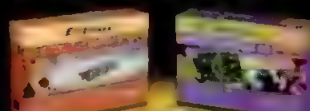
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Corporate Filtering

WebSense's list customization options are fairly standard and easy to implement. Notably, you can also add sites to the list that you would simply like to screen to determine whether they should be blocked.

In addition, WebSense lets you block

in WebSense as it is in SurfWatch, either. As part of our testing, we created several filter sets and assigned them to different days and different times of day. As with CyberPatrol, you can assign different filter sets to individual IP addresses. But WebSense doesn't currently support user

assign those individuals the department's filter set. The more people in a department, the larger the headache. The ability to create user groups should be available in WebSense by the end of 1999.

In reporting, WebSense holds its own. The bundled reporting tool doesn't provide as many canned reports as the SurfWatch Reporter (you get about a dozen), but it more than covers the basics. In addition, you can export reports to an HTML file, making posting them to an intranet simple for quick management access. WebSense also offers lots of choices as to the type of information, such as IP address or specific protocol, that we wanted to log for our reports.

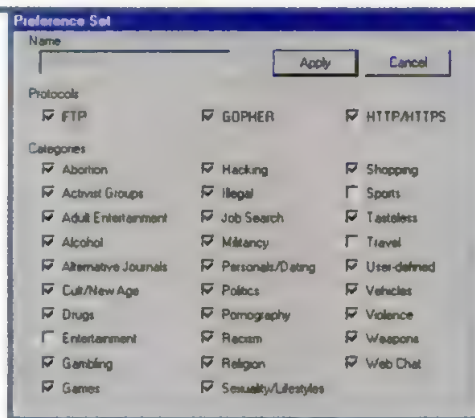
If your main concern is nearly picture-perfect out-of-the-box blocking, you can't go wrong with WebSense. Administrators will, however, have to endure some interface idiosyncrasies. And if the ability to set user group filters is a must (as it will be in large organizations), you'll be better served by SurfWatch@Work. —SLRW 

More than 500,000 sites in 27 categories make WebSense a blocking powerhouse.

by protocol, including FTP, Gopher, and HTTP. Being able to block FTP can stem the tide of unauthorized Internet downloads, if that's a problem.

WebSense's interface isn't as elegant an interface as SurfWatch's. The product has a generic Windows NT management-style interface with tabs, and it lacks a main menu like SurfWatch's that would let you easily jump around to filter sets, help files, and list customization. Also, determining from which screen you can create filter sets takes some guesswork, unlike using the clearly labeled filter-sets tab in SurfWatch's main menu.

Managing filter sets is not as intuitive



groups, an area where SurfWatch shines by tying into Windows NT's domains.

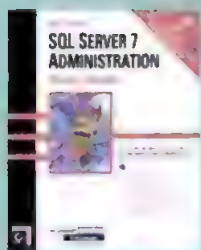
Without user groups, setting up filter sets for specific departments is arduous. You must enter the IP address of each member of a department manually and



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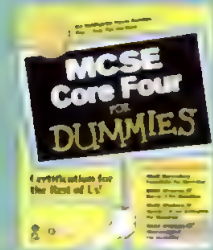
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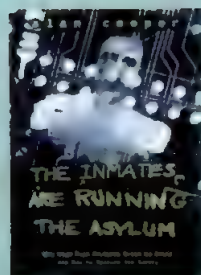
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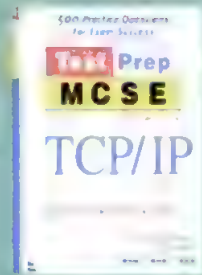
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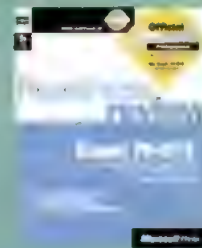
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TIPS, TRICKS, TOOLS, AND TECHNIQUES FOR YOU AND YOUR PC

SOLUTIONS

TUTOR

CDs and DVDs



With all the buzz about DVD technology lately, you may be wondering how it works and whether you need it. Here are the answers.

By Alfred Poor

Which has more tracks, a CD or a DVD disk? Most people know that a DVD holds far more information than a CD, so DVD would seem to be the right answer. But it's not. Actually, this is a trick question, because CDs and DVDs each have just one track.

Though CDs and DVDs share a number of features, they also have some important differences. After reading this, you should have a clearer picture of the two technologies and which best suits your needs. To understand these similarities and differences, it is helpful to start with their original missions.

COMPACT DISKS

CD stands for *compact disc* (although for consistency, some publications—including this one—spell the word *disk*). The technology was developed by Philips and Sony in 1981 as a medium for stereo music recordings. Vinyl records were easily damaged, had limitations in recreating the full range of sounds, and often suffered from cross talk—where a loud passage could be heard on an adjacent quiet passage.

CDs solved all these problems and more. Digital sound makes reproduction more accurate. The laser read head never touches the disk, reducing wear and tear. And no cross talk between adjacent lines occurs, because the sound data is stored as digital samples.

Data is stored as a series of pits along a single spiral path running from the center of the disk to the outside edge. The read laser is focused on the data layer within the plastic disk, where pits alternate with *land*—simply a smooth area without a pit. The reflected light bounces back through a prism and is reflected onto a photosensor that varies its voltage output based on the amount of light it receives. The pits and land do not directly represent data ones and zeros; as with magnetic media, the transitions between pits and land contain the data. When light hits a pit, it is more diffused than when it hits land. In this way, the read head is able to detect the transitions between pits in the groove, and thus recreate the data.

The elements on which data is recorded are impressively small: The track pitch—the space between the tracks—is just 1.6 microns, and the pits range from about 0.83 to 3.0 microns long. (A micron is one thousandth of a millimeter.) The pits are stamped into a polycarbonate plastic blank, and then this is coated with a thin layer of aluminum that gives the disk its characteristic silver color. This aluminum layer is then coated with a thin layer of lacquer, which provides a smooth surface on which the disk's label is printed.

More on the Web:

You'll find all of the articles, examples, and code files in this section at PC Tech online.

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USER TO USER



Keep text boxes in Microsoft Word where you want them; remove old

EZDrive information from a hard disk; what to do if Control Panel freaks out; Excel references based on the contents of a cell; updating time-stamps in Microsoft Access; and more. *Page 211.*

UTILITIES



AutoAct saves you from having to repeat the same mouse clicks and menu choices

over and over each time you start up your favorite applications. A Targeting Wizard makes teaching AutoAct your standard opening moves a snap. *Page 217.*

INTERNET BUILDER



Create state-of-the-art Web sites with JavaScript and Cascading Style Sheets. In

this tutorial, we show you how to customize a page based on the date or season and how to tailor pages to users' screen dimensions. *Page 223.*

PC TECH



Server-side JavaScript's power and flexibility are starting to get the developer

recognition client-side JavaScript has enjoyed for a few years. JavaScript is easier to use and more powerful than CGI. *Page 231.*



TUTOR

Many users don't realize it, but the top, printed layer of a CD is actually more vulnerable to permanent damage than the bottom, clear surface. If the top is scratched deeply enough to damage the reflective aluminum layer, there is nothing you can do but replace the disk. On the other hand, the laser actually focuses on a layer within the clear base, and it is able to see past small scratches on the surface in much the same way that you can focus on objects outside when looking through a window screen. And even if a scratch should be serious enough to block the laser's view, you may be able to polish it out and restore the CD.

Audio CDs use digitized sound based on a 44.1 KHz sampling rate, which provides a frequency response adequate for sounds up to 20 KHz in pitch (though some experts and audiophiles argue that this rate is not sufficient to capture essential psychoacoustic effects that occur beyond the range of the average person's hearing). Each sample contains 16 bits of data, which provides 65,536 different amplitude levels; conventional wisdom holds that this range provides ample dynamic range for loud and soft musical passages. And the sounds are recorded in two tracks for stereo sound.

44,100 samples of 2 bytes each (16 bits equals 2 bytes) times two channels yields a data transfer rate just over 176K per second. A single-speed CD-ROM transfers data at the same rate, but a portion of the data stream is taken by error-correcting information, reducing the effective transfer rate for CD-ROM to 150 KBps. If a bit here and there is dropped

from an audio CD track, the difference will probably be inaudible, but a single errant bit in a data or program file can have disastrous consequences.

A CD can hold up to 74 minutes of audio, which works out to a bit more than 783 million bytes. Take out the overhead for error correction and you get the standard CD-ROM capacity of about 680 million bytes.

As mentioned already, data is stored in a single spiral track. The data is evenly spaced in the track, which means that the data head reads more data in a single revolution at the outer edge of the disk than it does toward the center. Audio CDs require a constant, steady flow of data, which means that the disk must rotate faster when the head is near the center of the disk. This design provides a constant linear velocity (CLV). In contrast, a typical hard drive rotates at one speed, known as a constant angular velocity (CAV).

176 KBps is fast enough for CD audio data, but 150 KBps is slow for data applications. Computer multimedia programs and games use digitized video clips and large graphics files that require faster transfer speeds in order to run smoothly. CD-ROM drives have accelerated rapidly over the years, to the point where 12X

to 20X drives are commonplace and even faster drives are available. Note that many of these new drives use CAV alone or a combination of CAV and CLV when reading data (they also support the slower "single-speed" CLV required for audio CDs). As a result, actual data-transfer rates vary with the location on the disk. In most cases, you get the maximum rated speed only when reading the outermost track on a completely filled CD. Even at their minimum speeds, however, these drives are at least ten times as fast as the original "single-speed" drives.

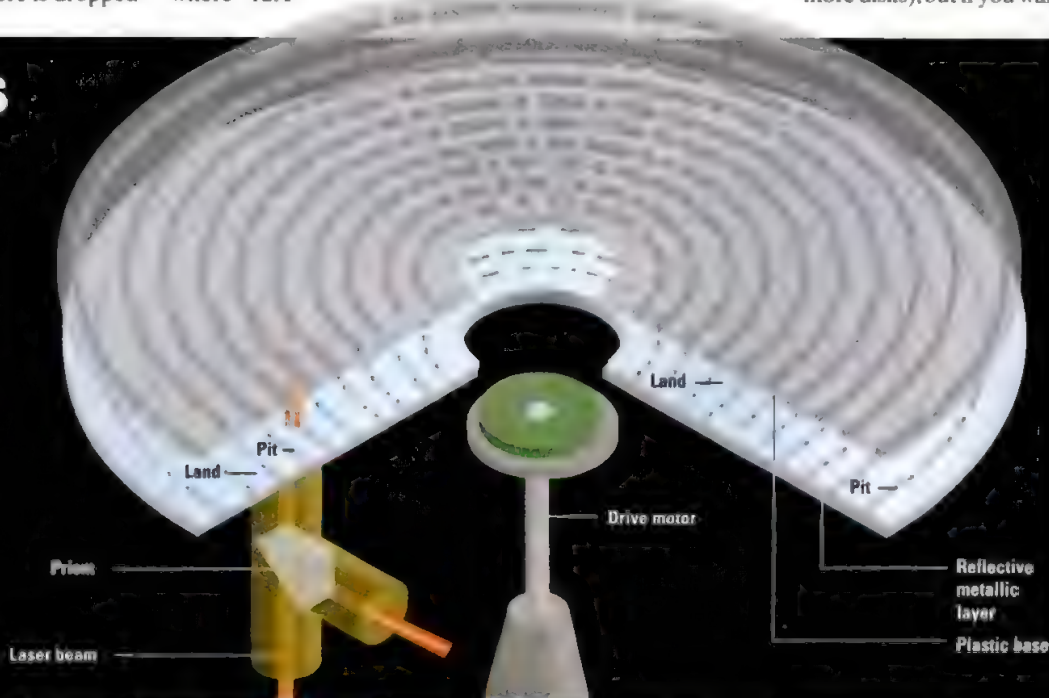
One variation of this technology bears special mention: recordable CD-ROMs, or CD-R. Standard CDs are read-only media; the information is physically stamped into plastic blanks and cannot be changed. CD-R technology makes it easy to create single copies of data (or music) that can be used in any standard CD drive. These work by placing a temperature-sensitive dye between the smooth plastic and reflective layers. When you use a CD-R drive to "burn" a disk, the write laser actually heats this dye layer to the point that its reflective properties are permanently altered. These altered spots diffuse the light from a read laser in a way similar to the pits on an audio CD or CD-ROM and thus can be read by most audio CD and CD-ROM drives.

VDOS

CDs are well suited to music albums or computer games and applications (though some are already spilling over onto two or more disks), but if you want

DVD Drives

As the disk spins, a laser beam is projected onto the data layer of the disk, consisting of land and pits. The beam is reflected by a metallic layer (usually aluminum) behind the pits and land, into a prism, which diverts the reflected light onto a light-sensing diode. The diode can detect the transitions from pits to land, and the sequence of transitions is converted to data.



to put a full-length movie on a disk, the CD format is just too small and too slow. The industry's answer is DVD.

Originally, DVD stood for *digital video disk*, because it was intended to be the delivery medium for digitized movies to be shown on home televisions. A little insight led to a universe of other applications for large capacity, high-speed optical disks, so the name was changed to *digital versatile disk*. Fortunately, almost everyone simply calls it DVD.

At first glance, a DVD disk can be easily mistaken for a CD. Both share the same 120-mm diameter dimension, and both are 1.2-mm thick plastic disks. Both rely on lasers to read data stored in pits in a spiral track, but that's about where the similarities end.

DVD is designed to hold a typical feature-length film, which averages about 135 minutes. With MPEG-2 compression, a full-motion image requires about 3,500 kilobits per second (Kbps). With 5.1-channel digital surround sound—center, left, right, left-rear, and right-rear directional channels, plus a nondirectional subwoofer channel—you need another 384 Kbps. Add in additional storage for dialog tracks in different languages and subtitles, and you reach 4,692Kb for every second of a 135-minute movie, which is 586.5 Kbps (kilobytes per second). Multiply it out, and you need a disk with a capacity of 4.75 million KB, which is often referred to as 4.75GB by the industry.

How can you get seven times the capacity of a CD on a disk with the same dimensions? Answer: Make the data elements smaller. The track pitch—the space between the grooves—shrinks from 1.6 microns to just 0.74 microns. And the smallest data pit size is reduced from 0.83 microns to 0.40 microns. The light wavelength from the laser in a CD drive is too long to read these small pits; in order to make DVD drives, engineers had to come up with a laser that produces 640 nanometer wavelength light, compared with the 780nm light used in CDs. This approach also requires that the disk platter be thinner, so the light does not have to travel through as much plastic to get to the data layer. The DVD disk design calls for a platter that is only half as thick as a CD—0.6 mm—so to maintain the same 1.2-mm thickness, a blank 0.6-mm platter is glued on top. (There are other uses for this top surface we will discuss in a moment.)

By shrinking the dimensions of the data pits, there is about twice as much data per track inch on a DVD compared with a CD. In order to reach the nearly 600-Kbps transfer rate required for a movie, the disk needs to spin faster than a standard CD.

For data uses, DVD-ROM specifies even faster data transfer rates. "Single-speed" calls

for 1.3 MBps, though drives with twice that speed have already appeared on the market.

Though 4.7GB may seem like an enormous capacity, the DVD specification already provides for even greater capacities. For example, instead of gluing a blank on top of the data-carrying DVD disk, why not put another data disk on top? This creates a two-sided disk with a total capacity of up to 9.4GB.

Many DVD movies have already taken advantage of this feature to put one version of a film, formatted for a normal TV or computer monitor with a 4:3 aspect ratio, on one side, and then on the other, a widescreen version formatted for a 16:9 aspect ratio.

And as they say on the late-night infomercials, But wait! There's more! By changing the focus of the read laser, it is possible to scan information from more than one layer of the disk. Instead of using an opaque reflective layer, it is possible to use a translucent one with an opaque reflective layer behind carrying more data. This does not quite double the capacity, as the second layer cannot be quite as dense as the single layer, but you can still use this approach to get 8.5GB on a single-sided, dual-layer disk. Use this approach on both sides of a double-sided disk and you can cram up to 17GB of data on a single DVD disk.

One of the main concerns of the major movie houses in creating DVD was illegal copying and distribution of movies. Also, the studios control the release of titles throughout the world; some markets will get a film in theaters long before some other markets, and so the studios want to prevent users in one part of the world from reading a DVD that has been released for use in another part.

This has resulted in movie DVDs with sophisticated security encoded into them, which makes the disks difficult to copy. Also, each DVD is coded to work only with players that contain the key for use a certain region of the world. In some cases you can reconfigure the key code—such as with DVD decoder cards for use with computers—but most limit you to only a few chances to make such a change.

We hope this discussion has left you with a better understanding of DVD technology and its potential. **PC**

Alfred Poor is a contributing editor of PC Magazine.

CD-ROM

CD-ROMs have a maximum storage capacity of 680MB. The smallest data pit on a CD-ROM can be 0.83 microns, and the track pitch (distance between tracks) is 1.6 microns. The drive uses a laser that produces light with a 780 nanometer wavelength.

DVD

Although it has the same external dimensions as a CD-ROM disk, a DVD can hold up to 17GB of data. This is partly because the smallest data pit is 0.40 microns, and the track pitch is reduced to 0.74. It's also because DVD technology stores up to four layers of information on a single disk. The laser used to read DVDs produces a light beam with a wavelength of 640 nanometers.

DVD Varieties

DVDs allow for up to four layers of data on a single disk. Data can be placed on both sides of the disk, and each side can contain up to two layers of data. In dual-layer formats, the first layer is translucent rather than reflective so that the laser beam can read past it.

■ Substrate ■ Adhesive ■ Lacquer ■ Reflective layer

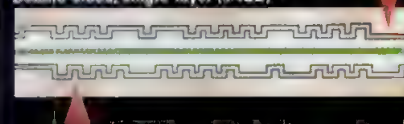
Single-sided, single-layer (4.7GB)



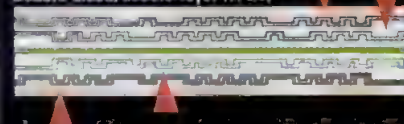
Single-sided, double-layer (8.5GB)

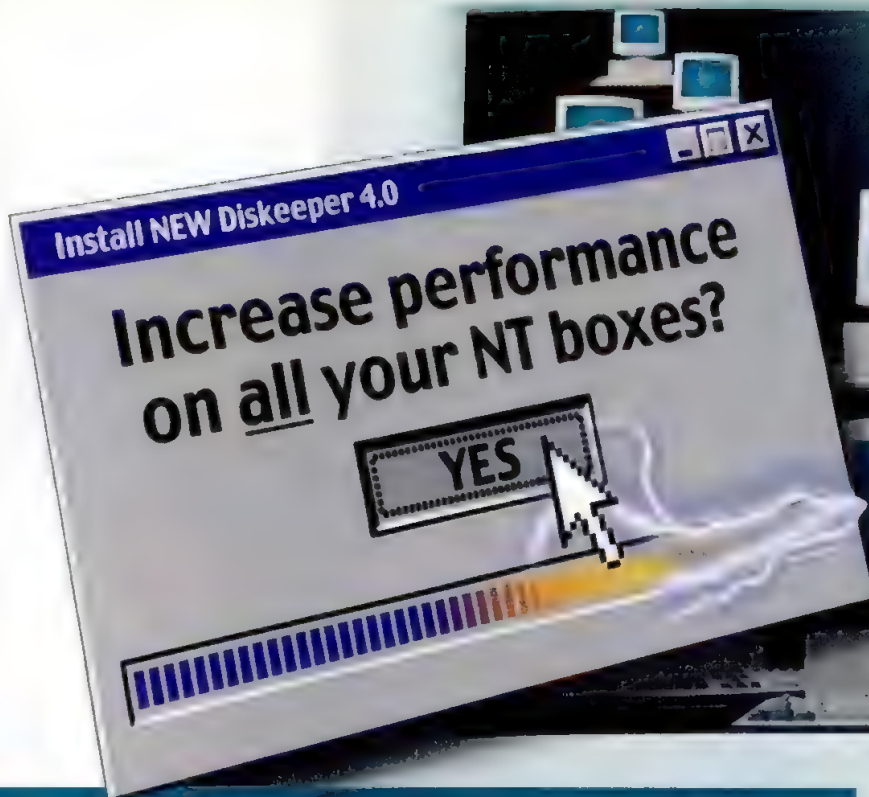


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USER TO USER

Keeping Text Boxes Under Control

I'm having a problem with linked text boxes in Microsoft Word 97: They won't stay on the page where I want them. It's easy to replicate the problem. Start with a new document, type a line of text, and then insert a text box by choosing *Insert / Text Box*. When the mouse pointer changes to a big plus sign, move it to where you want the upper-left-hand corner of the box, hold down the left mouse button, move the mouse pointer to define the box, and release the button to finish. Next, move the text cursor (insertion point)

of moving the box manually back to the previous page each time it moves to the next after various edits. Is there any way to prevent this?

Mark Smyth
via the Internet

PC The cause of your problem is simple: When you create a text box, it must be attached to a specific paragraph. Formatting the text box with no check in the *Lock anchor* box lets you move the anchor manually to another paragraph; this also lets Word move the anchor automatically to another paragraph if you move the text box on the page. But if you change the paragraph's position by typing additional text before it, Word will keep the anchor with the original paragraph. The lack of a mark in the *Move object with text* check box tells Word to leave the text box in its current position when you enter text that moves the paragraph the anchor is attached to. But that position is defined as being on the same page as the anchor. The result: When you add paragraphs before the one the text box is anchored to, so that the paragraph moves to the next page, the anchor and text box will move with it.

The easiest way to understand what's going on is to set Word so that you can see the anchors and paragraph returns. Choose *Tools / Options*, then *View*. Under *Show*, make sure the *Object Anchors* box is checked, and, under *Nonprinting characters*, make sure the *Paragraph marks* box is checked. Then choose *OK* to return to the document.

Once you've checked the *Object Anchors* box, whenever you have the text box selected you'll see the anchor that goes with that box in the left margin next to the paragraph it's attached to (Figure 1). If you enter a line of text in a blank document, for example, and then insert a text box, you'll see the anchor next to the one line of text. Add a few paragraph returns

before the original line of text, then select the text box again, and you'll see that the anchor has moved down the page along with the text. Add enough paragraphs to move the text line to the next page, and the anchor will go to the next page also, taking the text box with it.

To move the box back to the first page, simply grab the anchor and drag back to a different paragraph—any paragraph—on the first page. If you formatted the text box so it won't move with text, it will show up in its original spot on the page. You should find this a lot easier than moving the box itself. This will also move the anchor but will leave you the chore of positioning the box properly on the page.

To prevent the text box from moving to the next page in the first place, you can start by entering two paragraph returns and making sure the anchor is attached to the first paragraph. Then enter all your text starting with the second paragraph. And note that you can attach as many text boxes as you need to the same paragraph. Another possibility is simply to keep an eye on the anchor and move it up to an earlier paragraph if it starts getting near the end of the page.—M. David Stone

Hard-to-Remove EZDrive

I have an old 850MB hard disk that I have re-partitioned and formatted, and I have successfully installed Windows 95 on it. When it boots, the screen displays a reference to "EZDrive." A friend told me that the system's EZDrive files were still on the hard disk, even though I couldn't find any, and that I needed a program that would completely erase everything from the hard disk. Can you tell me how to get rid of this?

Jlm Yates
Magnolia, Arkansas

PC EZDrive is a program that provides software logical-block addressing (LBA) support for systems having BIOSs that do not support LBA. As you've discovered, it can be surprisingly difficult to eradicate.

LBA refers to a scheme that lets systems address hard disks with capacities greater than 528MB. It uses a translation system to alter the apparent numbers of cylinders, heads, and sectors per track, so that disks can physically have more than 1,024 cylinders and 63 sectors per track.

If a computer's BIOS does not support LBA, then the feature can be added either with a supplemental BIOS (included in a ROM chip on a hard disk controller or on a separate expansion card) or with software in the form of special drivers that modify the BIOS code

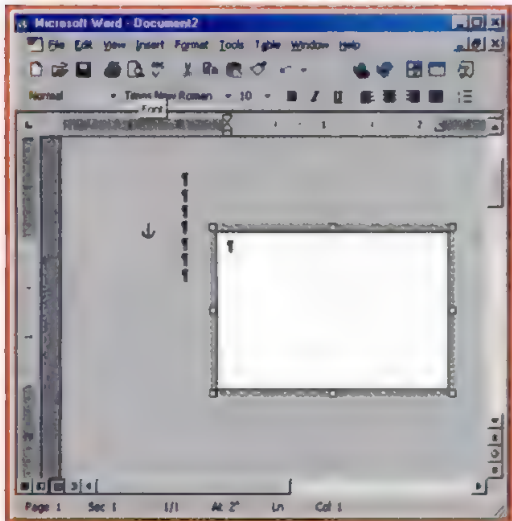


FIGURE 1: Word 97 shows you which paragraph a text box is attached to with an anchor character.

to the front of the line of text and hit Enter enough times to force it to the next page. When the text goes to page two, so will the text box.

I have yet to find a way to define the text box so that it will stay on the first page. It moves to the next page even if I select the text box, choose *Format / Text Box*, then *Position*, and make sure that the *Move object with text* and *Lock anchor* boxes aren't checked. Unfortunately, I often use a format that requires a text box, and I'm tired

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when the system boots up.

In order for the software approach to work, the program has to load before anything else happens with the hard disk. In the case of EZDrive, it installs itself in both the regular master boot record (MBR) on the hard disk and the boot loader MBR located on sector 1 of the hard disk. Just like a virus that infects the MBR, EZDrive must be removed in a special way. Because making changes to the MBR may prevent you from accessing your data, be sure to back up all data that you want to protect before you try to remove EZDrive.

One approach worth trying is to boot with a floppy disk that has no Autoexec.bat or Config.sys files but that contains the utility FDisk. At the DOS prompt, issue the command `FDISK /MBR`, which will cause the MBR to be rewritten.

If this does not succeed, download the complete EZDrive program from the Western Digital site (at www.wdc.com/support). This utility includes an uninstall function that should remove the software from your hard disk.—*Alfred Poor*

Fixing Control Panel

I recently discovered that my Control Panel is corrupted. Every time I bring it up no icons appear. Instead I get a flashlight moving back and forth, then a window with an error message. When I close the window, all my desktop icons are gone. If I happen to have a DOS session open and invoke the Control.exe program, the program fails but at least puts my icons back on the desktop. Otherwise, I have to reboot to get them back. Even after rebooting, Control Panel still doesn't work.

I've looked in the registry, and there is info about the Control Panel, but I don't know enough to tell whether it has been corrupted. On another machine, I noticed that the icons in Control Panel do not have Properties items on their right-click menus, so I couldn't investigate how to invoke the program directly without having to invoke the control panel. I've also looked at Control.ini, but I can't tell if it is causing the problem. Can you help me get Control Panel back?

Rick Bibolet
via the Internet

PC Many readers have written with similar problems, which all boil down to corruption in one of the Control Panel applets. Every time Control Panel loads, it scans the Windows\System folder for files with the extension .CPL, each of which may contain one or more applets. A corrupted CPL file causes the problem you're encountering. To identify the problem file, you'll have to go through a tedious process of elimination.

Open a DOS box, navigate to Windows\System folder, and enter the command `REN *.CPL *.CPX`. If you started Control Panel now, it would show no applets. Now rename one of the CPX files back to its original CPL extension. Launch Control Panel. Does it work? Next restore the original extension to another of the CPX files. Keep doing this until the problem reappears, indicating that the file you most recently restored is corrupt. Move that file out of Windows\System folder and continue, as there might be more than one corrupted file. When you've processed all the files, you'll have a working Control Panel containing only uncorrupt applets.

This kind of Control Panel problem is often caused by an uninstall program that removes an essential DLL without removing the CPL file. If the corrupt CPL file relates to a program or peripheral that's no longer present on your system, you can simply delete it. If the removal of the corrupt file has left you lacking some essential Control Panel function, however, you'll have to reinstall the CPL file that caused the problem.—*Neil J. Rubenking*

Adjusting Your Mouse Settings

Recently while showing a friend how to recover a "hidden" toolbar, I purposely used the mouse to size the taskbar down as far as it would go at the bottom of the screen. I've done this frequently and am usually able to recover the taskbar, using the mouse pointer to resize it. Unfortunately, this time I couldn't get the pointer to turn into the resize arrow, even after about 15 minutes of trying. I also tried toggling the taskbar's auto-hide option. This didn't work either. Then I realized that the mouse had an excessively high tracking speed. Very small movements would take the pointer from one side of the screen to the other. As soon as I slowed the mouse tracking speed I had no problem grabbing the top of the taskbar and resizing it.

Jim Beckham
Cedar Bluff, Missouri

PC On most systems, you can still adjust the height of the taskbar even if the tracking speed is set to the maximum, but if you do encounter this problem this tip will help. More important, you should understand that the

relationship between physical mouse movement and on-screen cursor movement is under your control. Try tweaking this setting; you may find a more comfortable speed than the default.

To change mouse settings, launch the Mouse applet in Control Panel. Click the *Motion* tab in the resulting dialog, and set the *Pointer speed* to suit yourself. Click *Apply* after each change and try the new setting; you may find you prefer a faster or slower value than you were previously using. In some cases, the installation of a mouse or other pointing device may install a different Control Panel applet, but there should always be an option to adjust the relationship between physical movement and cursor movement.—*Neil J. Rubenking*

References Based on Cell Contents

I'd like to reference data in Microsoft Excel files based upon the contents of cells within the current workbook. For example, if cell A1 contains ABC and cell A2 contains XYZ, I'd like to reference sheet XYZ in workbook ABC.XLS in formulas and have the reference follow any changes to the cells containing the file name (cell A1) and workbook name (cell A2).

Using the standard method of selecting external data ranges produces absolute references. Continuing with this example, if I wanted to access the contents of cell B2 in the external worksheet, and I used the standard method of highlighting the data, the result would be `=function('[ABC.xls]XYZ'!B2)`. This obviously won't follow any changes to cells A1 or A2 in the local workbook. Is there a way to accomplish this, or am I like the folks in Hell who want ice water?

John Miller
Deerfield, New Hampshire

PC Your refreshment comes in the form of the INDIRECT function. If you have a valid external address at A1, you can reference that external address at some other cell by writing the following:

```
=INDIRECT(A1)
```

For example, if A1 holds the text string

```
[ABC.xls]XYZ!B2
```

then `=INDIRECT(A1)` returns the value at B2 of sheet XYZ in workbook ABC.xls.

You can also use INDIRECT as an argument within another function.

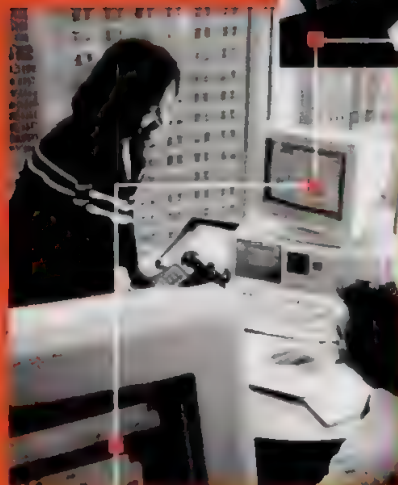
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Because you asked about building an external reference from a workbook name in A1 and a sheet name in A2, you probably want to concatenate A1 and A2 (using a text formula) to build a complete external reference in some other cell. For example, in A3, you might write:

```
= "["&A1&"]"&A2"!"B2"
```

Then you could write `=INDIRECT(A3)` to get the value of B2 on your external worksheet. Changes to A1 and A2 would be reflected in A3 as well as in the cell that holds the `INDIRECT` formula.—*Craig Stinson*

Testing for Empty Cells

I am using Microsoft Excel 97 and running Microsoft Windows 98. Is there a way to have cell A2 test for the existence of data in cell A1, which happens to be another spreadsheet file name? If there is no data, do nothing; otherwise get information from a specific cell in that spreadsheet.

Dan M. Marr
Houston

PC The simplest way to test for the existence of data in a cell is to use the `ISBLANK` function. `ISBLANK` takes a single argument and, as its name implies, returns true if the argument is blank. The argument is supposed to be either a single cell or the name assigned to a single cell. Oddly enough, however, the function does accept a range argument. In what appears to be a bug, `ISBLANK` in Excel 97 always returns false if the argument is a range, even if the entire range is blank.

At any rate, using `IF` with `ISBLANK`, you can cause one thing to happen if the referenced cell is empty and something different if it contains data. As for putting the name of an external file in A1 and getting data from that file if A1 is not blank, you can do so with the help of the `INDIRECT` function. Thus, for example, if A1 holds

```
MyFile.xls[Sheet1]!A2
```

then

```
=IF(ISBLANK(A1),"",INDIRECT(A1))
```

returns the contents of A2 on sheet 1 of MyFile.xls. If A1 is blank, the formula returns a null string.

If you want to have only a file name in A1, and not a complete reference to a specific cell on that file, you'll need to build the complete reference elsewhere using a text formula. For an example of such a formula see the previous tip.—*Craig Stinson*



Recording the Date Last Updated

Can Microsoft Access automatically update a time-stamp field when a record is modified?

Michael Mendelson
Santa Barbara, California

PC You can not do this automatically. That is, Access doesn't support a row-level trigger mechanism that gets fired on every insert, so you can't set an engine-level rule to update a field automatically on every inserted record. You can, however, insert code in your Forms to do the updating. The disadvantage of doing this is that you have to remember to place the code in every form that inserts new records. And you have to remember that records added outside of these forms will not be properly time-stamped.

To do this at the Form level, you first add the necessary Date/Time fields to your table. I'll use `DateCreated` and `DateModified` for this example. You then place the following code in the Form's `BeforeUpdate` event:

```
Private Sub Form_BeforeUpdate(Cancel
As Integer)
If Me.NewRecord Then Me![DateCreated]
= Now()
Me![DateModified] = Now()
End Sub
```

The `BeforeUpdate` event occurs before Access updates changed data in a record. You often use this event, for example, to validate data and cancel the update if some data proves unacceptable. The code shown above tests the Form's `NewRecord` property to see whether the update is for a new record. If it is, the `DateCreated` field is updated to record the date the row was added. Whether or not the record is new, the `DateModified` field is then updated to record the date when the record was last changed. The result is that when Access commits the data, the fields will have been properly time-stamped.—*Sal Ricciardi*

Two Applications, One INI File

I use two different clip-art editors. Each application has its own advantages, so I want to keep

both, but both applications call their INI file `Design.ini`. Of course the information in the two INI files is different. Every time I launch one of the applications, I first have to copy the correct `Design.ini` file to the Windows directory.

Is there a way to automate this process so that whenever I launch one of these applications, the correct INI file is either automatically copied to the Windows directory or loaded in some other manner?

Erik Robins
via the Internet

PC Here's a very simple solution that may work. Move each program's INI file into the folder from which that program is launched, with neither in the Windows folder. If you're lucky, each program will look for the INI file in the Windows folder and, not finding one, look in its own folder. Many programs are hard-coded to look for their INI file only in the Windows folder, however.

If moving each INI file into its program's folder doesn't work, you may be able to take advantage of the structure of INI files to combine the two. An INI file contains a number of sections, with headings enclosed in square brackets. Within each section are a number of key lines, taking the form `key=value`. All the keys below a section heading belong to that section, until the next section heading is reached. The order of sections within the INI file is irrelevant, and the order of keys within a given section is irrelevant. Most important, the normal Windows INI file functions ignore any sections and keys that they don't specifically "know."

Load the two INI files into Notepad and examine the section headings. Are there any headings that are used in both files? If not, the solution is simple. Append the contents of one of the `Design.ini` files to the end of the other, and save the combined file in the Windows folder. Each program will use the file, and each will read and write data in its own sections. You may want to add some comment lines to the combined INI file indicating which sections are used by which program. To create a comment line, simply use a semicolon as the line's first character.

Even if one or more section names are common to both programs, you still may be able to merge the two INI files. If none of the key names within the same-named sections overlap, you can merge the two files as described above, with one more step. You need to move all the keys from one of the duplicate sections into the other and delete the now-empty section. Here again, you may want to add comment lines indicating which keys belong to which program.—*Neil J. Rubenking* **PC**



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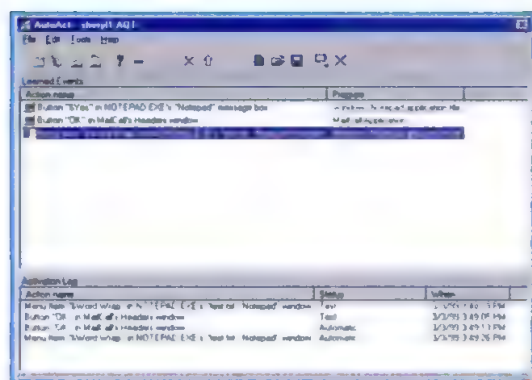
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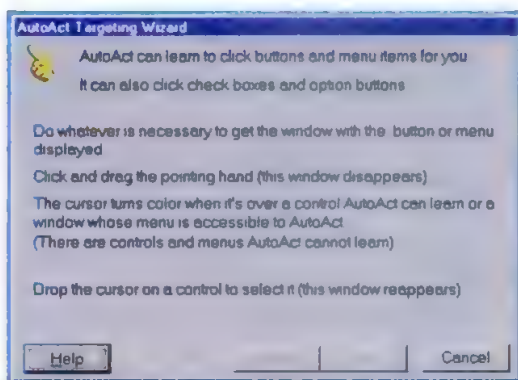
If a program's default selections are not to your liking or an unnecessary confirmation box requires an annoying extra mouse click, AutoAct may be able to help. It can, for example, automatically turn on word wrap when you launch Notepad, or click the Connect button when you launch a Dial-up Networking connection. Though AutoAct cannot activate toolbar buttons or other controls that look standard but are not, it can activate any true button, check box, radio button, or menu item.

AutoAct runs under Windows 95, Windows 98, and Windows NT. An article about how to use AutoAct and how it was written is available on our Web site at www.pcmag.com/utilities. You can also find a link to download the utility and its source code here.

Neil J. Rubenking, the author of AutoAct, is contributing technical editor of PC Magazine. Sheryl Canter is the editor of the Utilities column and a contributing editor of PC Magazine.



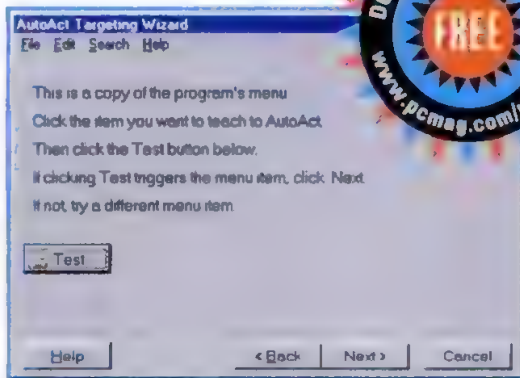
AutoAct lets you create sets of learned actions that you can edit and merge together. The learned actions are listed in the top part of the main window.



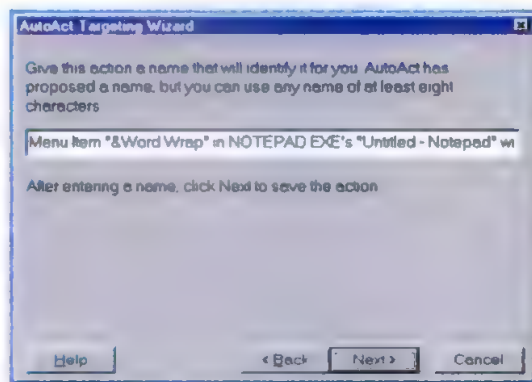
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The Targeting Wizard for menus includes a duplicate of the program menu you want to control. Choose from this duplicate menu to tell AutoAct which item to select.



The Targeting Wizard's final step is to request a name for the new learned action. A default name is supplied.



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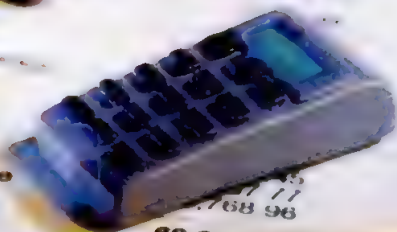
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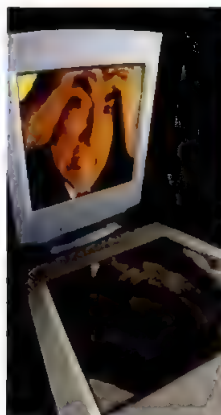
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GoBack Ad20 Guy In The	10/15/98 2:42:17 PM
C:\c:\win\sys	10/15/98 2:37:46 PM

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INTERNET BUILDER

JavaScript-Powered Stylesheets

By William Robert Stanek

Green with envy after visiting the latest cutting-edge Web site? Wish you could create designs like that? Well stop dreaming. Just about anyone can create a state-of-the-art Web site, but to do so you need the power tools of the Web elite: JavaScript and Cascading Style Sheets (CSS). Use JavaScript to make your Web site interactive; use CSS to give it a polished design. Combine the technologies—creating stylesheets powered by JavaScript—to tailor the Web site to the needs of individual users.

JavaScript-powered stylesheets can make style assignments when a document is first loaded into the browser window for individual HTML elements, CSS classes, and HTML elements with unique IDs. You can use this type of stylesheet to create pages that will update automatically based on user preferences, user environment settings, or even the date. We'll show you how to tailor your site to individual users' displays and dynamically update it for special occasions and holidays.

When you create a dynamic Web site, a key concern is browser compatibility: Your site must work with Microsoft Internet Explorer and Netscape Navigator. If these browsers supported the same object models and technologies, implementing such a Web site would be a lot easier. Unfortunately, you either have to create two different versions of your pages (one for IE and one for Navigator) or design code that works in both browsers. The latter alternative is usually the best, and it is what we'll focus on. Additionally, the techniques you'll learn won't break older browsers. In noncompliant browsers, your pages' content will simply display as initially designed, with no customization.

SETTING THE STAGE

Version 4.0 or later of Internet Explorer and Netscape Navigator support traditional stylesheets and JavaScript-powered stylesheets. Traditional stylesheets use predefined style rules to control the layout and appearance of elements in Web pages. To change the appearance of text in paragraphs, you can make a style rule for the `<p>` tag, such as the following rule that sets blue text on a yellow background:

```
p {color: blue; background-color: yellow};
```

Style rules like this one are made in the document header using the style element



With JavaScript and stylesheets, your site can show different background colors depending on the season. The left is for Halloween and the right for Christmas.

and normally affect all paragraph elements in the document. On the other hand, if you only want the style rule to apply to a single element, you can assign style rules within the body of a document. You do this with an inline style notation such as:

```
<p style="color: blue; background-color: yellow">Hello World</p>
```

JavaScript-powered stylesheets build on the concept of header-defined and inline stylesheets, but a few twists are needed for cross-browser compatibility. IE supports dynamically assigned style rules as long as there is a header-defined style element available with a unique identifier. Via JavaScript, you can add rules to this style element by refer-

encing its unique identifier. Navigator 4.0 supports script-based modification of stylesheets, but only from script elements defined in the header. If you don't specify style rules in the header, the page must be reloaded for any style changes to be visible. Following these requirements, you can set up your code to accommodate both browsers as shown here:

```
<head>
  <!--Insert an empty style assignment
  with ID for IE 4.0-->
  <style id="ssa"
  type="text/css"></style>
  <!--Insert script in header for NN
  4.0-->
  <script language="JavaScript">
  <!--
  //Insert dynamic style assignments
  //here. Both IE and NN will use
  //these rules.
  <!-->
  </script>
</head>
```

When you get into advanced scripting, however, you may actually need to create header-defined scripts for Navigator and body-defined scripts for IE. In IE, some key properties needed for dynamic customization are available only from within the document body.

BUILDING BLOCKS

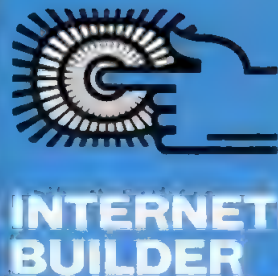
The next step is to determine how to assign style rules dynamically in JavaScript. With IE, you reference the specific stylesheet you want

to work with (via its unique identifier) and then use the associated `addRule()` method to set style rules. The general syntax for `addRule()` is:

```
document.styleSheets["style_id"]
.addRule (css_property + ":" +
prop_value)
```

where `style_id` is the unique ID for a header-defined stylesheet, `css_property` is the CSS property or element name, and `prop_value` is the value of the property. With this in mind, you can add a style rule for `h1` elements to a stylesheet as follows:

```
document.styleSheets["ssa"].addRule
("h1", "color:blue");
```

```
<html>
<head>
<style id="ssA"
type="text/css"></style>
<script language="JavaScript">
<!--
if (document.all) {

document.styleSheets["ssA"].addRule
("h1", "color:blue");

document.styleSheets["ssA"].addRule
("h1", "font-size:50pt");
} else if (document.layers) {
document.tags.h1.color="blue";
document.tags.h1.fontSize="50pt";
}
// -->
</script>
</head>
<body>
<h1>Hello World</h1>
</body>
</html>
```

Setting style rules for IE and Navigator.

Another common use for `addRule()` is to set values for a specified class type or an HTML element identifier. Here, style rules are added for all instances of `h1` with the class `special` and the unique ID `Open`:

```
document.styleSheets["ssA"].addRule
("h1.special", "font-size:18pt");
document.styleSheets["ssA"].addRule
("#Open", "font-size:10pt");
```

In Navigator, you reference CSS attributes as JavaScript properties. Although one-word attributes generally have an identical property name, multiple-word attributes need to be massaged a bit. You do this by removing the hyphen between the words and capitalizing the first letter of the second and successive words. Following this rule, the `font-size` CSS attribute becomes the `fontSize` JavaScript property.

With Navigator, you use the `document.tags` object to make style assignments for HTML elements and the `document.classes` object for CSS classes. Here, style assignments are added for `p` tags and the class `mOver`:

```
document.tags.P.fontSize="12pt";
document.classes.mOver.all.fontSize=
"36pt";
```

Using the `ids` object, you can make style as-

signments for HTML identifiers as well. The following example makes a style assignment for an HTML element with the unique identifier `Winner`:

```
document.ids.Winner.fontSize="22pt";
```

In IE, you manipulate named page elements via the associated style object. In Navigator, you manipulate these elements via the `document` object. If you create a paragraph with `id="test"`, you could set its font size using `test.style.fontSize` in IE and `document.test.fontSize` in Navigator. (This technique is described in depth in "DHTML That Works in Both IE and Navigator," January 19, 1999).

Because IE and Navigator have different techniques for making style assignments, you need a way to determine which syntax to use when. The best way to do this is to check for supported objects. Only IE 4.0 or later supports the `document.all` object. Only Navigator 4.0 or later supports the `document.layers` object. Figure 1 shows one way to check for the presence of these objects. Here, `h1` elements are set to blue with a 50-point font in both IE and Navigator. If you need to perform multiple checks for object support, you may want to test for the objects, assign the results to variables, and then reference the variables in your code:

```
!Explorer = (document.all) ?
true:false;
if (!Explorer) { //do IE stuff
```

Obviously, you can make static assignments such as those shown in Figure 1 through a traditional stylesheet. Fortunately, we're just hitting the tip of the CSS iceberg. Beyond the world of fixed values for style rules is the realm of the dynamic, where all values can be defined on the fly.

GETTING DYNAMIC

Now that you know how to set style rules, you can use this knowledge to create a customizable Web site. IE and Navigator 4.0 or later provide a set of objects and attributes that make Web-site customization a whole lot easier. One of these objects is `screen`. Use `screen` to tailor your Web site based on users' monitor settings. For example, if a user's screen width is less than 800 pixels, use one font type and size.

Otherwise, use a different font type and size.

The core screen properties supported by both IE and Navigator are `width` for determining screen width, `height` for determining screen height, and `colorDepth` for determining the bit depth of the color palette. You'll find `colorDepth` useful if you are concerned with how images look when dithered to a lower bit-depth. If you have a high-resolution 24-bit image that is unreadable when dithered to an

```
<html>
<head>
<style id="ssA"
type="text/css"></style>
<script language="JavaScript">
<!--
if (document.layers) {
if (window.innerWidth < 600) {
//set tag sizes for small screens
such as:

document.tags.h1.fontSize="25pt";
} else {
//set tag sizes for large screens
such as:

document.tags.h1.fontSize="50pt";
}
// -->
</script>
</head>
<body>
<script language="JavaScript">
<!--
if (document.all) {
if (document.body.clientWidth
< 600) {
//add style rules for small
screens such as:

document.styleSheets["ssA"].addRule
("h1", "font-size:25pt");
} else {
//add style rules for large screen
such as:

document.styleSheets["ssA"].addRule
("h1", "font-size:50pt");
}
// -->
</script>
<h1>JavaScript-Powered
Stylesheets</h1>
</body>
</html>
```

FIGURE 1 Customizing a Web site based on window size.

See Johnny.

See Johnny set up his
WebRamp in 10 minutes.

See Johnny get
15 co-workers online.

See Johnny pay for only one
phone line and one ISP account.

See Johnny enjoy his raise.

Before lunch.



Tired of waiting in line to get online? Paying too much for multiple phone lines and ISP accounts? Or is your office becoming "modem-mangled"—adrift in a sea of wires from individual modems? With the award-winning WebRamp, those days are over. The easy-to-install WebRamp gives everyone in your office separate and simultaneous Internet access through one device for less than \$500. We invented this technology so small businesses or branch offices can share fast Internet access with one device, one phone line and one ISP account. And the WebRamp is loaded with features like security, remote dial-in, VPN and things elaborated at www.rampnet.com/ad/pcm.html. So drop by, and pick up a copy of "Secrets Behind Cheap Internet Access". Or just call 1-888-726-7638 toll free.

WebRamp

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8-bit palette, for example, you may want to swap in a completely different image for users with a lower color depth.

Although screen is useful for determining monitor settings, the object doesn't tell you the dimensions of users' browser windows. A user may have a screen size of 800-by-600 but only 640-by-340 of usable space within the browser window. This same user may also have resized his browser so that only a 480-by-250 area is available for viewing documents. Fortunately, both Internet Explorer and Netscape Navigator provide ways of determining the actual amount of screen real estate available to the browser.

In IE, you have several different ways of determining the size of the browser window. `body.offsetWidth` and `body.offsetHeight` tell you the edge-to-edge width and height of the browser window. `body.clientWidth` and `body.clientHeight` tell you the width and height available to documents (meaning space allocated to margins, scroll bars, or toolbars is not counted). Navigator has similar properties. `window.outerWidth` and `window.outerHeight` provide edge-to-edge values. `window.innerWidth` and `window.innerHeight` provide internal values.

Once you obtain size values for the brow-

ser window, use these values to tailor the document. Set the font size for headers, paragraphs, and other text elements. Choose alternate banners, images, and mappings. Resize tables, divisions, and layers precisely. Figure 2 shows how you can dynamically customize a Web page based on window size. Note that although Navigator lets you use a header-defined script, IE does not. In IE, window size properties can only be read from the document body or after the page has been loaded.

A SITE FOR ALL SEASONS

Setting style rules based on window size is only the beginning. You can apply the techniques you've learned in other ways as well. You could create a Web site that has completely different styles for spring, summer, fall, and winter, or one with different styles for holidays such as Halloween and Christmas.

To determine the time of the year, you'll use methods of the date object. `getDay()`

tells you the day of the week; you can use it to create different versions of a Web site based on whether it is a weekday or the weekend. The values 0 to 6 correspond to the days Sunday to Saturday. `getMonth()` tells you the current month; you can use this method to determine the season or the approach of a holiday. The values 0 to 11 correspond to the months January through December.

Figure 3 shows how to set Christmas colors when the month value is November or December. One unfortunate drawback to using the date object in client-side scripts is that the time and date values are based on readings from users' computers, which may not always be accurate. Because of this, you may want to use a server-side script to determine the date.

In the example, style rules are applied to the entire body element by assigning a class name to the body tag. You could also assign the class name to individual elements within the document, such as paragraphs, table cells, or divisions. When you apply a background color to text elements, there are a few things you should note. IE fills in background colors for the entire element, meaning the color will extend to the right edge of the browser window. Navigator, on the other hand, displays background colors only behind an element's text, meaning the color will not extend to the right edge of the browser window.

To achieve the same background color effect in both browsers, you may need to rework your code. If you want the background color to fill to the right edge of the browser window (as it does by default in IE), use a table with `width=100%` and then assign a style to the table's header and data cells, like this:

```
<table width=100%>
<tr><td class="season">
Edge to Edge</td></tr>
</table>
```

If you want the background color to appear only behind the element's text (as it does by default in Navigator), use a span element and then set the style for the span, as follows:

```
<p><span class="season">
Only Behind the Text</span></p>
```

This has been only a small sampling of what you can do with stylesheets and scripting. We hope these techniques will bring your Web pages closer to the cutting edge. 

William Stanek is a frequent contributor to PC Magazine's Solutions section. He can be contacted at writing@tvpres.com.

```
<html>
<head>
<style id="ssA" type="text/css"></style>
<script language="JavaScript">
<!--
var myDate = new Date();
var month = myDate.getMonth();
if (document.layers) {
    if ((month == 10) || (month == 11)) {
        document.classes.season.all.color = "red";
        document.classes.season.all.backgroundColor = "green";
    }
}
if (document.all) {
    if ((month == 10) || (month == 11)) {
        document.styleSheets["ssA"].addRule (".season", "color:red");
        document.styleSheets["ssA"].addRule (".season", "background-
color:green");
    }
}
// -->
</script>
</head>
<body class="season">
<h1>JavaScript-Powered Stylesheets</h1>
<p>Isn't this cool?</p>
</body>
</html>
```

FIGURE 3: Creating a Web site for all seasons.



"If you've been holding out on buying a scanner because you think they're too complicated, you'd better find another excuse. Microtek's ImageDeck is as easy to set up as a toaster."

— *PC Computing*, March 1999



Digital Focus
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February 1999

"It looks like Microtek has added another first with its new ImageDeck scanning unit. ...a good choice for walk-up scanning situations, such as in offices that don't want to buy every employee a scanner."

— *Smart Computing*, March 1999

"This scanning appliance doesn't connect to a computer, and it works with both Macs and Windows: a Nobel Peace Prize candidate." — *Family PC*, March 1999

"The first scanner that makes sense for office use. Office denizens can use it exactly like a copy machine." — *Computer Shopper.com*

"...will be a boom to self-serve computer services such as Kinko's and large offices that need occasional scanning services, but don't want to dedicate an employee or Mac to do it."

— *The Mac Observer*

"The first stand-alone device with a built-in floppy and an Iomega Zip drive. Installation is easy since it's not attached to a PC."

— *Fortune*, January 11, 1999

"...ideal for use in a small office or a department." — *Business Week*, February 1, 1999

"...a great deal for small offices and workgroups looking for no-fuss, no-muss scanning. I was very impressed with the [ImageDeck's] ease of operation as well as its scan quality."

— *Computer Shopper*, December 8, 1998

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DVD H/W accelerator	128 bit memory interface



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AWAYS, VIGNETTES AND COLLAGES? WE'RE
STILL BLUSHING OVER THE RAVES FOR ITS
SNAZZY CUSTOMIZABLE INTERFACE, IMAGE
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BUT THEN HUMILITY CAN BE HIGHLY
OVERRATED.

Comparing [Freehand, Illustrator and CorelDraw] directly to Canvas is like comparing apples to, well, the whole basket of fruit...In the competition of the graphics titans, Canvas 6 is fighting with a unique set of weapons." **Macworld, February, 1999** "SpriteLayer technology is an excellent piece of programming wizardry. With it, designers can easily experiment with complex graphic ideas that would have been prohibitive or impossible in any other program." **Digital Design and Production, January/February, 1999** "With its elegant interface, Canvas is a compelling alternative to suite-based solutions that require separate illustration and image editing programs to perform the same functions." **PC Magazine, January, 1999** "...A standalone graphics application that skillfully integrates its separate components. Canvas 6's price and its range of tools combine to earn it a place on our WinList." **Windows, March, 1999** "...An integrated, easy-to-use graphics package that's so sophisticated you're not likely to outgrow it... We found Canvas 6's transparency tools alone to be worth the upgrade price." **PC Computing, March, 1999** "The hype is well deserved...Canvas 6 features a variety of transparencies that can significantly bump up the oh-la-la quotient of your images." **MacAddict, April, 1999** "Deneba has done what Adobe has refused to do: unify graphics apps...Canvas 6's unique ability to combine disciplines will lead the designer down previously inaccessible creative paths...SpriteLayers composite like no other program can." **Maximum PC, January, 1999** "Canvas 6's array of new transparency tools allows you to create awesome depth and layering in your images - and it does so better than other graphics products on the market today." **MacAddict Magazine, January, 1999** "Canvas continues to deliver a vast scope of graphics tools in one convenient application, and does a remarkable job of breaking down barriers between bitmap and vector graphics." **PC World Online, December 28, 1998** "...No program comes close to Canvas's ability to combine vector and bitmapped graphics...Canvas 6's strong integration of text, painting and drawing tools makes it a good one-stop graphics application." **Macworld, March, 1999**

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Server-Side JavaScript

By William Robert Stanek

Corporate Web sites aren't novelties any more. More and more, these sites are viewed as critically important to an organization's success, driving a burgeoning need for industrial-strength sites with applications to match. Netscape's server-side JavaScript is one of the most powerful technologies available for meeting this need.

JavaScript is one of the most popular programming languages ever. The core language includes all of the statements, operators, objects, and functions that make up the basic JavaScript language and are applicable to both client and server applications. JavaScript has additional objects and functions specific to client-side or server-side functionality. You use client-side JavaScript, which is supported by Netscape Navigator, for working with Web pages and client browsers. Server-side JavaScript, available in Netscape Enterprise Server and Netscape's e-commerce products, enables back-end access to databases, file systems, and servers.

WHY SERVER-SIDE JAVASCRIPT?

Although client-side JavaScript has been widely accepted and used in Web pages for some time now, developers are only beginning to understand the power and flexibility that server-side JavaScript offers, including a number of functions, objects, and structures for developing Web-based applications. Such applications can combine client-side and server-side JavaScript and HTML. One type of Web application, for example, may include a group of Web pages each serving a different function and accessed based on user selections or actions. Unlike traditional Web pages that rely solely on HTML, however, these pages can be generated entirely from JavaScript or a combination of HTML and JavaScript.

Client-side scripting has been very useful for creating dynamic content for Web pages and providing preliminary validation for user input, but you often need a server component to handle the follow-on processing of information submitted by the client. For example, if a user submits a registration form, the serv-

er component could parse the form contents, set up an account, and then inform the user that the account is ready. Traditionally this has meant some sort of CGI solution. Server-side JavaScript is more powerful and easier to use than CGI, and it can dramatically reduce programming complexity and development time. You can often replace hundreds of lines of Perl or thousands of lines of C or C++ with a few dozen lines of HTML and JavaScript.

Server-side JavaScript's advantage stems from the fact that it has a well-developed framework for handling a wide range of com-



mon tasks. Because this framework contains high-level functions and objects, you can develop advanced solutions with minimal coding.

THE ARCHITECTURE

Most JavaScript applications follow a three-tier client/server architecture, with Web clients in the first tier, a Netscape Web server and database client in the second tier, and database servers and legacy data in the third tier. The first tier provides the user interface for the application, the necessary code to

pass information to the second tier, and often data validation routines. As indicated earlier, the server passes HTML and client-side JavaScript to the client without interpreting them. Because of this, the type of Web client really doesn't matter as long as the client has a compatible JavaScript interpreter. Your needs will determine whether you tailor your front-end for a specific client or use generic functionality that will work in all JavaScript-capable clients.

The second tier provides the application logic and manages security for the application using server-side JavaScript. This tier consists of a Netscape HTTP server with JavaScript support and, if the application accesses a database server, a database client. The access controls on this tier determine whether clients outside a firewall can access the application.

The second tier is also where you'll find the Netscape server and JavaScript runtime environments. The key component of the Netscape server runtime is NSAPI, which connects your applications and the JavaScript runtime environment to the server. Key components of JavaScript's runtime environment include the JavaScript runtime library, the LiveWire database-access library, and the Java Virtual Machine. The JavaScript runtime library provides the primary server-side services, objects, and functions. LiveWire lets your server-side applications access relational databases. The Java Virtual Machine is used by Java applications running on the server.

The third tier supplies access to data and functions provided by database or application servers. You can also access legacy data and code written in programming languages such as C and C++. Normally, you do this through LiveConnect, an enabling technology that connects JavaScript with other technologies such as applets and plug-ins.

Now let's take a closer look at the features of server-side JavaScript, including session management, file and mail services, and database access. We'll also look at services for accessing other programming languages.

SESSION MANAGEMENT

Session Management service manages requests and maintains state information. The service consists of five objects: request, client, project, server, and lock. To understand these objects, you need to understand how they are used and when they are created in the runtime environment.

Request is the shortest-lived of the session management objects, lasting only for the duration of a single client request. Typically, client requests occur when a user enters a URL or clicks on a hyperlink. You can use

request to examine information sent in client requests, such as the data submitted in a form, or to examine information about the client and the client request, such as the type of client being used.

To manage user sessions and maintain state information, you will rely on the `client` object. `Client` maintains user-specific information across multiple requests. Although many different users can access an application simultaneously, each user has a unique client object for that application. Further, users always have different client objects for different applications—even if those applications are running on the same server. You can use `client` to maintain user preferences, such as settings for colors and fonts, or users' account information, such as user names, passwords, and account numbers.

The runtime engine actually creates and destroys `client` objects with each request. By destroying client objects that are not currently in use, the runtime engine saves system resources—notably memory. You can't restore a client object at the beginning of each request without client-maintenance techniques such as cookies or URL-encoding.

Often you will need to pass information among clients and applications. You do this with the `project` and `server` objects. `Project` maintains state information for multiple clients using a particular application; `server` maintains state information for multiple applications running on a particular server. These objects are often used in conjunction with `Lock`, which lets you control access to a section of code temporarily.

You can use `project` to track any properties or values related to a single application. Application administrators may need to obtain current usage summaries, such as the current number of users or the average number of transactions per hour. `Project` can also handle real-time interactions among users, of the sort online chat programs require.

A new `project` object is created each time you start an application, and the object is destroyed any time you stop or restart an application. Because a single server can have multiple separate instances of an application, each instance of an application has its own unique `project` object.

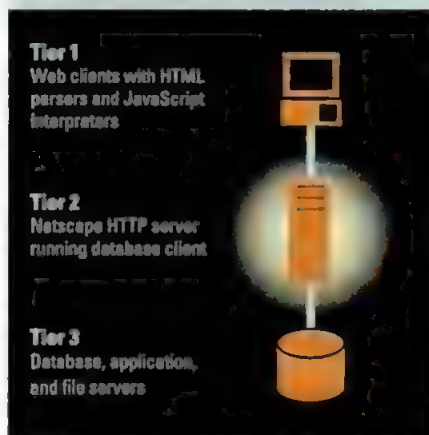
Server objects let applications share information. For example, as a user moves from one application to another, server can pass on the user's preferences and login information. A `server` object is created when the server process is started and destroyed when the server process is stopped. All applications using the same server process share the same `server` object. Any time a host machine runs



multiple server processes on different ports there will be multiple server objects. These objects will correspond to the specific server processes and ports they answer on. For example, a server process on port 80 will have a different server object than a server process on port 8080.

Netscape's server provides a multithreaded environment for JavaScript applications. Though multithreading speeds up processing and improves performance, it can lead to conflicts over which process has control of an application's objects and properties at any given time. To prevent this, an application

A JavaScript Application's Three-Tier Architecture



should control access to the `project` and `server` objects. The application can handle access controls using either explicit locking or an instance of the `Lock` object.

With explicit locking, `project` and `server` are locked by invoking their respective `Lock()` methods. `Lock()` blocks access to the object until `unlock()` is called. Unfortunately, there is no time-out built in, so users can be locked out of the entire application if `unlock()` isn't invoked. As this isn't optimal, you may want to create an instance of the `Lock` object instead. With `Lock`, you control not only access to a key section of code but also how long the lock lasts and which objects and properties it affects.

FILE AND MAIL SERVICES

File System Service lets you store persistent data and manipulate files. The `File` object is not intended for working with databases but is very useful when you need an easy-to-use data-storage solution. You use `File` to read,

write, and search for files on the application server. You can't use `File` to work with files on the user's system.

`File` can work with both ASCII text and binary-formatted files, but reading and writing ASCII is much easier, because you can read and write data line-by-line or use strings. With binary files, on the other hand, you must break strings down into individual characters before you read or write. These individual characters are one byte in length and must be converted to a numeric value for reading and writing.

Mail Service consists of the `SendMail` object; you use it to generate mail messages within server-side JavaScript applications. The term *SendMail* may remind you of the Unix process used to generate mail messages, but the `SendMail` object is available for both Windows and Unix environments. `SendMail` lets you send multimedia such as images, sound files, and videos and also supports the multipart message syntax, which lets you send messages with attachments.

Once you create an instance of `SendMail`, you can use its properties to determine the fields used in your e-mail messages, how content is encoded, and where the message is sent. Generally, properties of `SendMail` correspond to actual fields in the e-mail message. For example, you use the `To` property to name recipients and the `From` property to name the sender.

`SendMail` directly supports the general fields used with standard SMTP servers, so you can create properties for custom fields as well, and then use these fields with custom mail servers or clients. Because custom fields are sent in the message header, they are generally subject to the restrictions of RFC 822, the specification that defines the standard for Internet messages (which states that all user-defined fields should have the prefix `X-`).

DATABASE ACCESS

Server-side JavaScript provides a complete Web-to-database solution, and whether you want to create a database-query engine or a complete database-management system, you can use server-side JavaScript's LiveWire Database Service to help get the job done. The service supports native drivers for DB2, Informix, Oracle, and Sybase, as well as for databases that conform to the ODBC standard. Features supported by the service include database pooling, pass-through SQL, cursors, and stored procedures.

Keep in mind though that your server environment ultimately determines the types of databases you can work with, as well as the features of LiveWire Database Service that are available to you. So before you begin any project planning or work on a Web-to-data-



FOCUS ON YOUR CUSTOMER

Customer-focused, customer-driven. Over the past decade, the giants of Corporate America have made the customer their strategic centerpiece, investing huge sums in information technology to help them improve their customer relationships.

And, what they've been saying is, 'We have to start treating our customers like small businesses do...with the same personal attention to their needs and the same ability to customize a product or a service.'

While big businesses are using technology to play catch up with companies with one, five, ten, or 20 employees, small businesses all over the world are finding out they can use those same solutions to build their advantage.

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Software solutions can help small businesses serve their customers better than ever, while at the same time helping them improve their own productivity. There are software solutions that not only put the power of information technology at their fingertips, but also protect customers from the problems that systems can cause.

Symantec has spent nearly two decades providing such solutions to individuals, businesses and other institutions around the world, making them more productive and keeping their computers safe and reliable — anywhere, anytime.

"With such revolutionary developments as corporate downsizing, computing and the Internet, the number of small businesses around

you more touch and feel when it comes to your customers?

Understanding

Customer-driven means that a business offers its customers products and services they really need, rather than presenting "a product in search of a market." The price is right; the packaging and shipping is the way they want it; their operation is 24 hours a day, so your support is too. The best businesses are the ones that understand their customers well enough not only to see all this, but also to see what's coming around the bend.

It's never been an easy task. You need to know your customer base by market or geographic segment, but that's not enough. You need to

tools can help you maintain the professionalism and personal touch you've been known for, reminding you and your staff about important customer dates and events.

Responsiveness

Responsiveness on a day-to-day basis says you provide customers with the answers they need when they need them. So sales and service people — no matter where they are — must have instant, easy access to customer databases and the ability to transmit quotes, presentations, and even training programs to customer sites. Access can also be speeded by technology that, for instance, enables caller ID to bring up the record before the sales or service person says "good morning."

It doesn't matter what information your customer needs and how fast, there's a communication vehicle for getting it there and you have to use it all: e-mail, voice mail, fax, overnight delivery. For instance, computer-to-fax is the fastest way to get your customers hard copy. We're talking about hard copy you send from your computer that might contain a just-assembled combination of the latest promotions and product illustrations.

Further, your customers should be able to access your systems to obtain the same information via e-mail or "fax on demand."

Voice mail? It's your image, they say, and technology exists for any size company to make sure you sound right, respond quickly, and keep a record of calls and faxes.

Productivity

Being able to provide your customers with better products and ever higher levels of service, being

Be understanding, responsive, productive and protective. This is what being customer-driven is all about.

the world has exploded," says Symantec's Dana Siebert, VP, Americas. "This is great because small businesses have always been a major source of innovation and service. A primary goal for companies like ours has to be to help level the playing field for them and contribute to their growth.

"What we're saying here is they have an advantage — their understanding of and responsiveness to their customers — and we think we can help them keep it."

The Touch and Feel of Technology

What does it mean to be customer-focused and customer-driven? How can technology give

know your customers individually and they need to feel that you do — that you know their business, you know them as people.

For instance, to create winning proposals over and over again, you want your customer's plans and the history of your relationship at your fingertips. We're not only talking volume, credit history, and the bottom line, but also the nuances of how you have worked together.

Technologically, both the top-down planning and the individual interaction require a customer database: an information file on your customers and their accounts — the notes, the phone discussion logs, the presentations and proposals.

As your company grows, software

FOR MORE INFORMATION VISIT US ON THE WEB AT

able to develop and retain close relationships with individual customers as your customer base grows — all this carries a cost to your business. You can't stay customer-driven as we've described if your resources are strained and your bottom line suffers.

The technology solutions we've noted above — the customer and prospect database, word processor, e-mail messaging and other communications tools such as computer-to-fax and the calendar — are also crucial productivity tools for your organization, allowing them to be responsive to customers literally at the push of a button.

To improve ease-of-use, while safeguarding your investment in new and older computing equipment, such tools must operate on all major computing platforms.

These tools are win-win solutions for the front lines of your business — the people who plan and deliver what the customer needs. You also need technology that protects your business and your customer's, and solutions exist for your back office to provide these safeguards.

Protection

Flash...computers are vulnerable and fallible. They crash, wiping out that 10-page proposal you hadn't saved. They can get viruses. Installing new programs can mess up your system. Worse, you can wipe out data on your customer. And, electronically connected to your customers, you can send them a virus that wreaks havoc on their systems.

The good news is that technology solutions exist to fend off these problems.

Small Business Solutions



ACT![™] turns contacts into relationships and results. This customer and calendar management software provides instant access to critical information about your customers and appointments and triggers on-screen alerts to remind you of important dates. ACT! supports Internet and a mail access and lets you share information with your team.



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TalkWorks PRO[™] makes a more professional image for small businesses with up to five employees. This voice and fax communications software provides fax on demand, enabling your customers to dial your computer and initiate faxes of promotions, price sheets, and other information. Away from your office? **TalkWorks PRO** can call you with messages to caller numbers. Other features: multiple mailboxes and call management, tracking all calls and faxes.



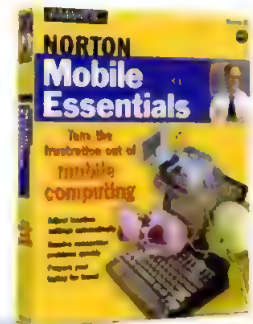
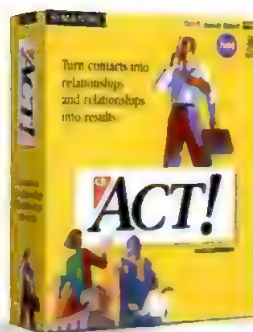
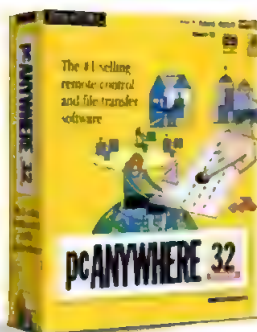
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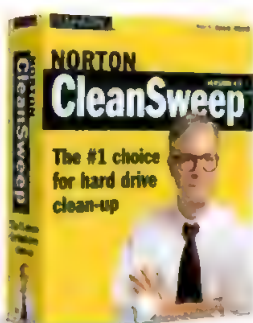
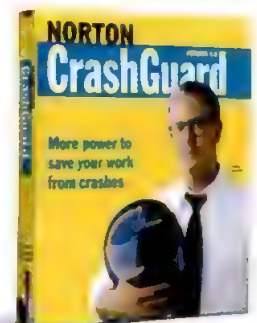
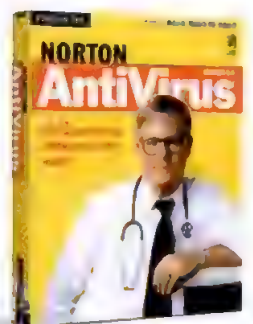
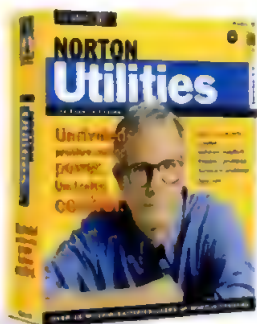
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base application, you should determine whether the service works within your current server environment. If the service does not support your current server environment, you may need to modify or upgrade your HTTP server, database client, or ODBC components. And even if the service works, you'll still need to make sure that it supports the features you need.

There are four basic steps for working with a database: mapping the database structure, establishing a connection to the database, handling database transactions as necessary, and finally, releasing the connection. Let's explore these steps in more depth.

Map out the database structure. To extract records from a database, you may need to know the names of tables and columns. To update data, you may need to know the acceptable data types, the maximum allowable data size, whether the column accepts null values, and other pertinent information. If you are working with an existing database, obtaining this information before coding your application is fairly easy. But if you're creating a new database for the application, you should create a prototype of the database before you start programming the application. Once the database structure is in place, map out its properties, writing down the pertinent information such as table names, column names, and acceptable data types. This makes working with the database much easier.

Establish a connection. LiveWire Database Service provides two ways to connect to a database: shared connections and pooling. A shared connection is accessible to a single user at a time; other users are locked out of the database as long as that user is connected. With pooling, on the other hand, multiple users can access a database at the same time via a *connection pool*.

Think of a connection pool as a jar full of access cards. When a user needs access to a database, he takes a card out of the jar. When others need access to the database, they can take cards out of the jar, and so on. If at any time the jar becomes empty, the next user must wait until a card is returned to the jar.

With either connection method, application performance is often tied directly to the availability of database connections. If no connection is available when a user needs one, the application has to try to obtain one and the user has to wait. Because of this, database connections are usually established on the application's initial page and then made available to users on an as-needed basis. The exception

is when your application requires users to log on to the database with a user-specific sequence. In this case, you would probably want to establish the connection when it's needed. For example, if users must access the database using their login names and passwords, you should establish connections the first time users try to access the database.

Handle transactions. Once you establish a connection, users can perform any actions permitted by their profile, which may include database queries and updates. Database queries can be handled with pass-through SQL, read-only cursors, and stored procedures. Database updates can be handled with pass-through SQL, updateable cursors, and stored procedures.

Whenever you update a database, you should use explicit transaction controls. With

this framework, JavaScript applications can call functions written in C—and through C, other programming languages, such as C++ or Visual C++. Because you don't have to convert the functions to JavaScript, you reduce development time and often gain the advantage of improved performance.

Functions written in a programming language other than JavaScript are called *native functions* and must be placed in an external library that can be accessed or shared dynamically in the runtime environment. For Windows systems, the external library must be a dynamic link library (DLL). For Unix systems, the external library must be a shared object. Once you place a native function in an external library, you must register the library with the JavaScript runtime environment. Registering the library tells the runtime engine that applications are cleared to access the library.

If you want to go beyond the external library framework, you'll need to use LiveConnect. In the server-side environment, LiveConnect is essentially a set of extensions for Java. These extensions make it possible for JavaScript to

access Java, and through Java any objects that are CORBA-compliant. CORBA (short for *Common Object Request Broker Architecture*) specifies an architecture for communication between distributed objects. With CORBA, the operating system and the object's programming language don't matter as long as the object complies with the architecture.

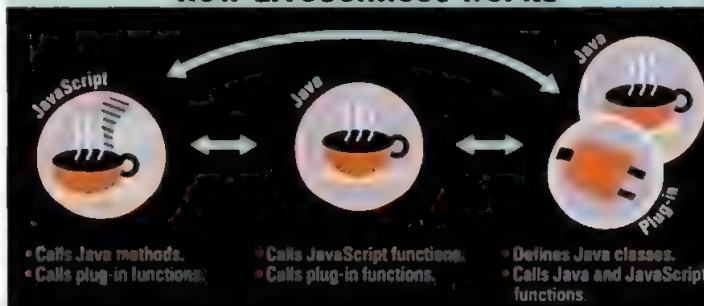
Java objects interact with other objects via an intermediary called

an ORB (object request broker), which lets objects make and receive requests from other objects. When a request comes in, the ORB intercepts it and maps the request to the object that is supposed to handle it. Afterward the ORB invokes the appropriate method in the receiving object and passes available parameters as necessary. Finally, it returns the results to the object that made the request. Fortunately, once you create the necessary objects and extend them for CORBA, all this interaction takes place behind the scenes.

Server-side JavaScript lets you leverage your knowledge of this powerful scripting language to create dynamic Web applications that can run in any browser and on any platform. It's especially useful for building the database-driven applications so necessary to corporate success on the Web today. **PC**

William Robert Stanek is a frequent contributor to PC Magazine. He can be contacted at writing@tvpres.com.

How LiveConnect Works



transactions, you perform a group of actions together. If the actions are successful, you update the database. If any of the actions are unsuccessful, you restore the database to its original state.

Release the connection. When a user completes a transaction, you usually want to release the database connection. Releasing the connection doesn't necessarily mean breaking the connection with the database. With a shared connection, you release the lock on a database object, which ensures that other users can access the database. With a pooled connection, you return the connection to the pool, which ensures that it is available to other users.

ACCESSING OTHER LANGUAGES

If you have existing functions written in another programming language and you want to incorporate their functionality into a JavaScript application, JavaScript's external library framework will come in handy. Using

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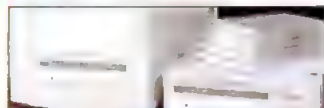
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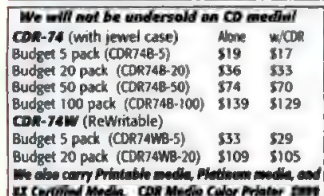
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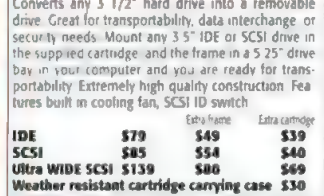
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18.2GB	7200	IBM	IBM31850LW	\$789
18.2GB	7200	IBM	IBM31850LW	\$939
18.2GB	7200	Seagate	ST318275LW	\$1209
18.2GB	7200	Quantum	Q18M1820LW	\$1739
18.2GB	10,000	IBM	IBM39130LW	\$1009
36.4GB	7200	IBM	IBM39130LW	\$1549
36.4GB	7200	Seagate	ST118275LW	\$2049
36.4GB	10,000	Seagate	ST118275LW	\$2369
50.1GB	7200	Seagate	ST150176LW	\$2559

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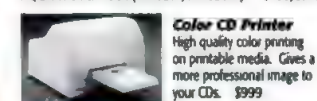
Motomasa / Panasonic SCSI 4x8
Int/Ext SCSI (CDR7502B/CDR7502BX) \$229/\$319
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IDE	Brand	Model	ms	Int
32X	Toshiba	XM6202B	80	\$61
32X	Tec	CD532E	85	\$67
40X	Mitsumi	CRMCFX40X	85	\$64
40X	Pioneer	DRU944	70	\$64
40X	Toshiba	XM6502B	79	\$71
40X	NEC	CDR3000	75	\$66
52X	Kenwood	UCR412	90	\$120

IDE CD CHANGERS

Speed	Brand	Model	# Disks	Int
16X	Nakamichi	MJS16A	5	\$129

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25 Watt (SPEAKER) \$99 35 Watt (SPEAKERPRO) \$129
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Speed	Brand	Model	ms	Int
32X	NEC	CDR1910	85	\$84
32X	Tec	CD532S	85	\$95
32X	Plexstor	PX3275Tms	85	\$115
32X	Plexstor	PX3275C(saddy)	85	\$159
36X	Pioneer	DRU766S	70	\$83
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40X	Plexstor	PX401TS	85	\$139
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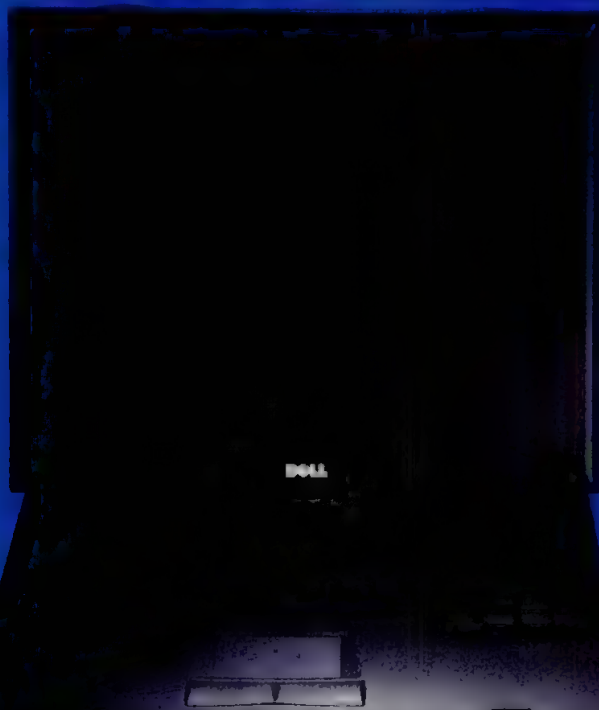
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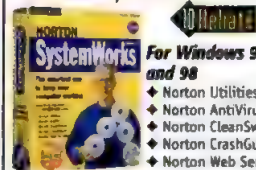
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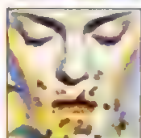
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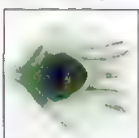
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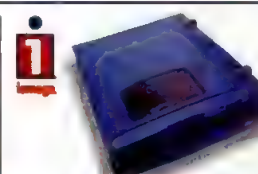
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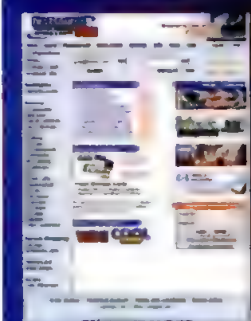


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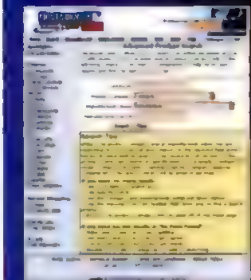


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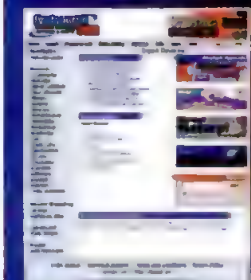
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442437	TP770Z	366 PII MMX	128	14.1GB	DVD	13.3" TFT	56K	Win 98	\$4,749
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442837	PCGF180	333 PII MMX	64	4.3GB	DVD	14.1" TFT	V.90	Win 98	\$2,199
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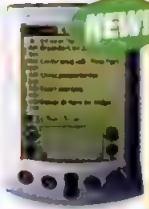
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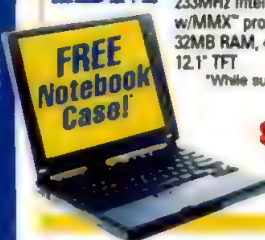
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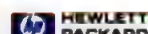
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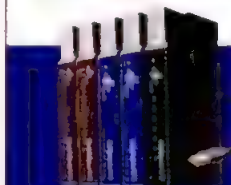
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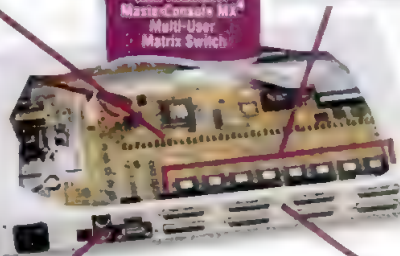
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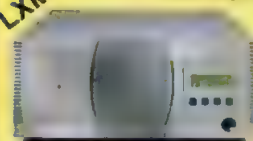
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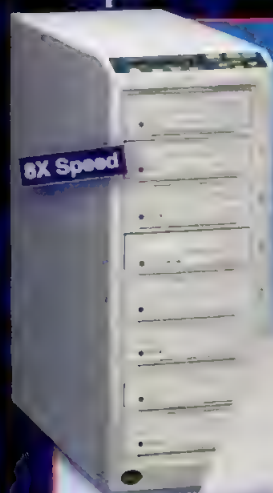
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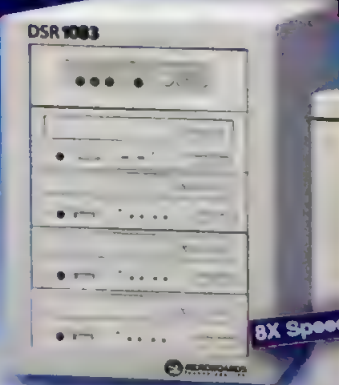


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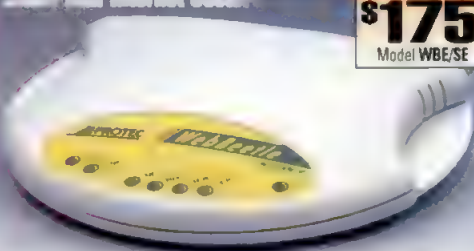
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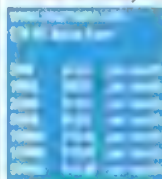
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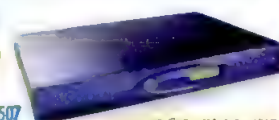
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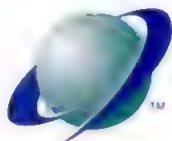
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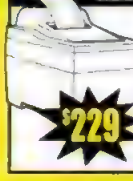
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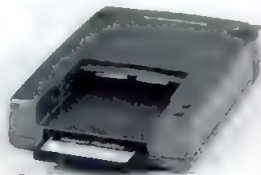
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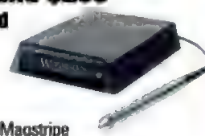
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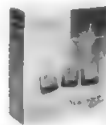
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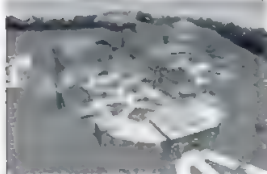
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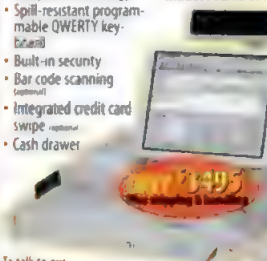
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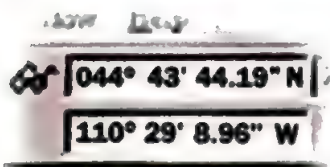
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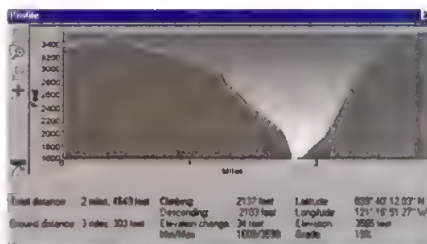
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Net Guards

By Michael E. Ryan
and Jennifer Triverio

How do you monitor and control what your child sees while surfing

the Internet when you are not around? Web filtering software can help, protecting kids from sexually explicit Web pages and other questionable material flooding the Internet.

For this roundup, we tested eight popular Web filtering packages to see how well they filtered out sexually explicit Internet content and other objectionable material such as drug-related information, hate propaganda, and content advocating violence. We tested these packages on a group of bookmarked test sites and newsgroups and on a series of Web searches on Excite, HotBot, and Yahoo! None of these packages are fool-proof, and it still must be noted that parental supervisors offer the best level of protection against adult material circulating on the Net.

Cyber Patrol 4.0



Cyber Patrol 4.0 requires a fair amount of setup time—and a weekly download to keep the program updated—but if you are willing to invest

the time, you will be rewarded with the most comprehensive filtering of any of the products we tested.

Cyber Patrol uses a list-based approach to filtering Internet material. Downloadable CyberNO Lists—updated weekly—block sites in categories including nudity, profanity, drugs, intolerance, violence, and gambling. During setup, you decide which categories should be restricted. If you want to access just kid-friendly sites, the CyberYES Lists provide this type of information. CyberYES Lists focus on educational and fun content for kids age 6 to 16. You can create user profiles for up to nine family members.

You can't view the actual lists, which is a bit annoying, because it would be easier to edit them if they were made available. But you do have the ability to override the program's choices by adding

to see whether your child is trying to access "bad" sites.

In addition to filtering, Cyber Patrol's time management function lets you keep track of and control when and for how long each user is allowed online. Also

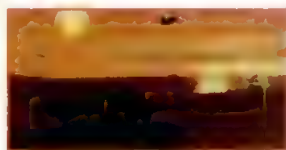


and deleting specific sites.

The program's filtering capabilities are on a par with the best we saw, blocking almost all of the sexually explicit sites, as well as the hate-inspired sites that so many of the other programs allow kids to access. Cyber Patrol doesn't have a monitoring feature, so you won't be able

of note is the ChatGuard feature, which lets you block words and numbers (an address and phone number, for example) from being divulged in a chat room or on a message board.

Cyber Patrol includes free weekly updates for one year; thereafter, an annual subscription is \$29.95 list.—JT



ALL-OUT COMBAT

Wargasm offers up exciting air and land battles. *Page 278.*

GRUNTZ

Helping these little gooeys get home involves being strategy-minded and solving loads of inventive puzzles. Are you up for it? *Page 280.*



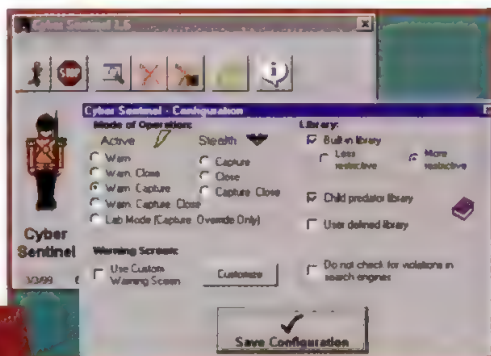
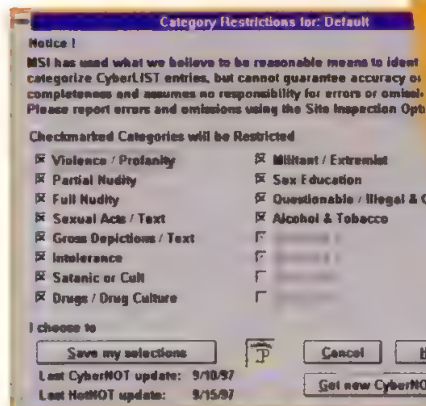
ILLUSTRATION BY BRIAN RASZKA



Cyber Sentinel 1.6

Although Cyber Sentinel 1.6 offers a no-hassle setup and provides a wide range of monitoring options, it lacks in several key areas, from customization to filtering.

The program lets you select several different monitoring configurations in active and stealth modes. These options range from a simple warning that a site is objectionable to a site being blocked and a screen capture being stored. All of these options are appreciated, but the fact that you can configure the program only for a single user is not. Also, even when a site is blocked by the Cyber Sentinel shield, we found that you can still get

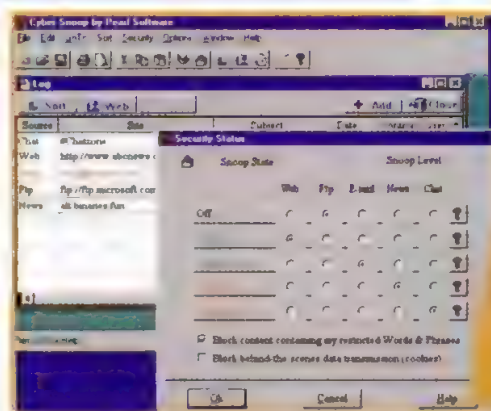


be quite sure what's being blocked unless you customize your own word library.

Cyber Sentinel requires a dedicated effort on the user's part to ensure proper filtering.—JT

Cyber Snoop 3.0

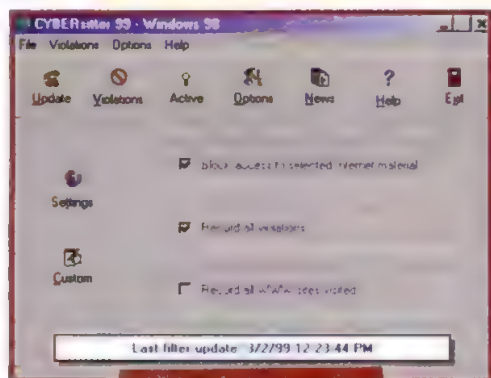
Unequivocally, Cyber Snoop 3.0 offers the best monitoring features of the group, letting parents observe where and when a child has been on the Internet. Should your knowledge be deterrent enough for your child, Cyber Snoop, with its easily customizable activity log, is



quite an eyeful before the blocking screen does its job.

The Advanced Recognition Engine does a commendable job blocking sexually explicit sites, newsgroups, chat rooms, and e-mail. You can even prevent children from divulging their phone numbers. But Cyber Sentinel goes a bit overboard, blocking sites that merely mention the word *pornography* or *sex* without giving due consideration to context (an antipornography site or news article on sexual harassment, for example).

We were able to access sites dealing with racial hatred, drugs, and violence without fail. To block these types of URLs, it's necessary to add phrases to the user library. The program comes with a built-in library, but you can't access its word lists; therefore, you can't



the solution for your household. The program's filtering capabilities, however, are not as robust as we would have liked.

Running transparently in the background, Cyber Snoop creates a detailed account of the sites visited, complete with information on the date and time your child surfed by. You can sort and edit this activity log, and you can click on any of the URLs to access a site directly. In addition to Web sites, Cyber Snoop catches

es chat, e-mail, and FTP news. You can export the activity log to either a text file or an HTML page.

Cyber Snoop, as its name indicates, focuses on Internet monitoring. And we found the program's monitoring functions quite extensive. We wish the filtering aspects were much more proactive, however. On installation, the filtering functions are inactive; the lists are basically empty. Your job is to input keywords, URLs, newsgroups, chat rooms, and e-mail addresses as either Blocked or Allowed. The task is a bit overwhelming. To get you started, you can request a "starter" list of not-recommended sites, but even that list is lacking. Keyword blocking, which is new in Version 3.0, is an appreciated addition.

Cyber Snoop is ideal for parents interested in keeping an eye on their children's Internet activity.—JT

Cybersitter 99

Solid Oak Software's Cybersitter 99 is one of the most effective Web filtering packages we tested, but the program uses inconsistent and confusing methods for blocking objectionable material.

The program filters out material based on a filter file and does real-time scanning of each Web page's content for any words or phrases that match the file. Filter updates are free. Cybersitter can update this file automatically through its auto-download feature.

Cybersitter's content-filtering capability is very impressive and worked on Web sites containing sexual content, drug references, and hate speech. Newsgroup filtering was less effective, though Cybersitter did manage to block access to a few obviously pornographic groups.

We aren't thrilled with the methods Cybersitter uses for blocking. Some attempts at accessing objectionable sites are

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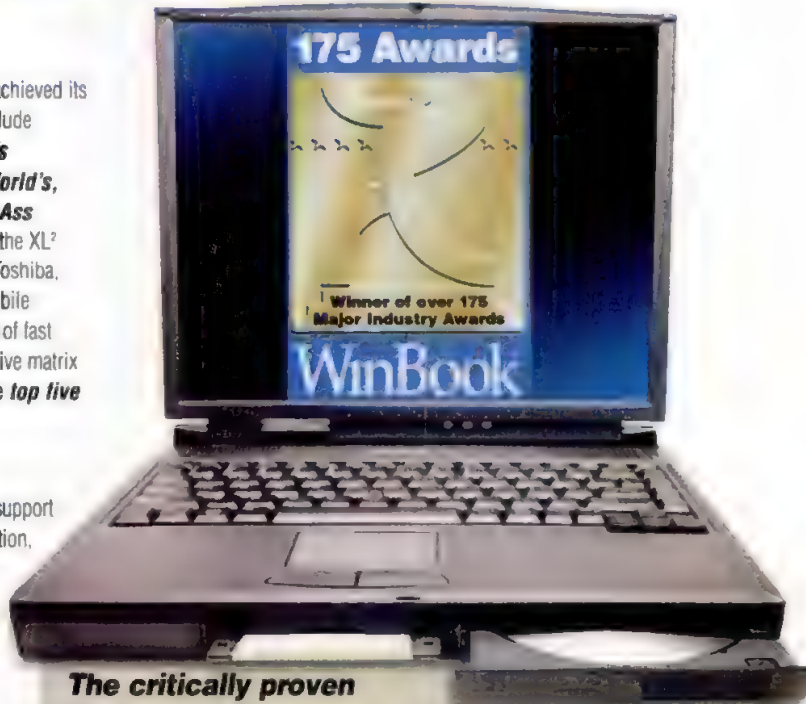
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redirected to kid-friendly pages (such as Homework Central), and that's fine. Other times, a "server returned invalid response" message appears. But most of the time, the product simply causes the browser to render an incomplete page, with all blocked material left blank. This gives the impression that the page is still loading, and we believe that a more emphatic message, such as "This site blocked by Cybersitter," would be better.

Though this is certainly one of the more reliable Web filtering tools in the group, we think Solid Oak needs to address several of Cybersitter's issues before it can be considered a top contender.—MER

Net Nanny 3.1

Net Nanny 3.1 can block just about any sort of questionable material. This popular program can nevertheless be confusing and tedious to use.

Net Nanny uses lists of "bad" words, URLs, and phrases to filter out objectionable material. You can completely customize these lists, and you can update them with downloads from Net Nanny's Web site. This process is far from intuitive, however, as you must delete your current lists (one at a time) and then download and install a ZIP file before importing the new lists. And even then the lists are inactive until you turn them on (again, one at a time). Net Nanny 4.0 is supposed to include an auto-update feature.

Though you can modify the lists to block just about anything, the default lists are not effective (even the most current ones). Each one of our test sites came through Net Nanny without a problem. Web searches

yielded mixed results, but, next to SOS KidProof, Net Nanny is the least-effective filtering product we used for Web browsing. News-group filtering, however, was highly effective.

Also, the filtering features did not work at all until we manually added Explorer.exe and Msimn.exe (Microsoft Outlook Express) to the list of executables to watch—a highly unintuitive process.

Still, Net Nanny offers a host of filtering options, including the ability to block outgoing name, address, and credit card information. And it can be quite powerful once you learn all of its idiosyncrasies. We hope Net Nanny 4.0 will be more intuitive and user-friendly.—MER

SOS KidProof 1.5

If you're looking for a utility that will prevent your kids from changing vital system settings and accessing specific applications, SOS KidProof 1.5 can help. When it comes to the basic

job of reliable Web filtering, however, SOS KidProof is a major disappointment.

Though it does a great job protecting your essential Windows settings from unwanted modification, SOS KidProof offers very little

the test sites we tried to load directly, and it even blocked some of our attempted Yahoo! searches (particularly any with the words *Jenny McCarthy* in them). When we moved over to Excite, however, SOS KidProof suddenly went belly up, and we were able to retrieve countless adult Web sites with little or no interference from the program. Also, news-group browsing was completely unfiltered.

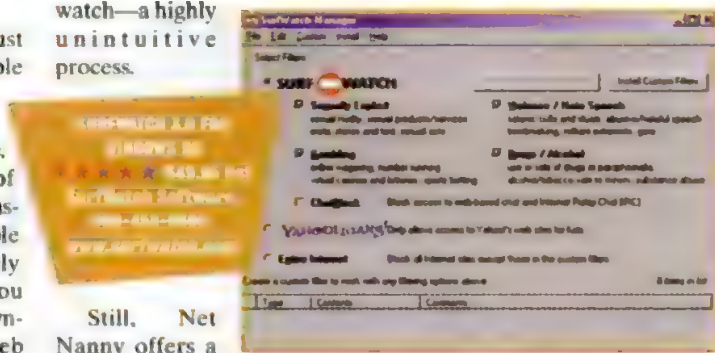
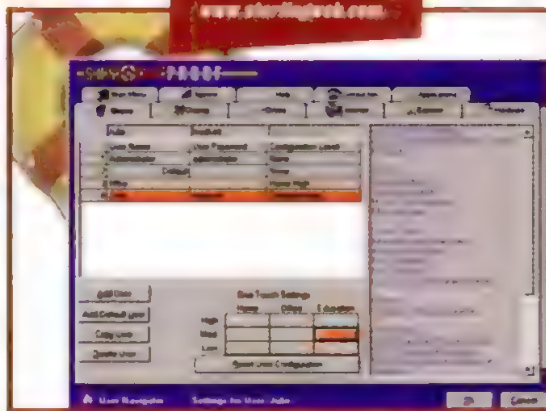
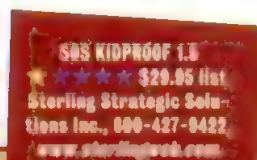
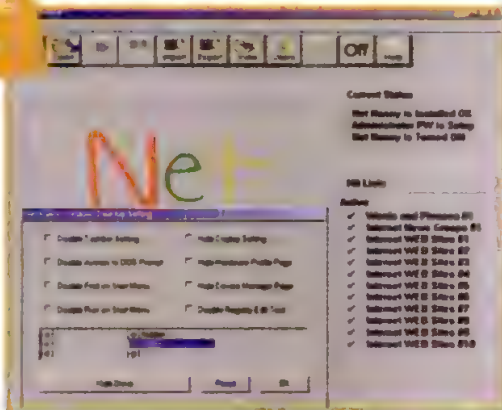
This product has a ton of potential and can do quite a bit that other products cannot (for example, protecting system settings). But until the Web filtering capabilities are improved, SOS KidProof simply cannot compete with the other products in this category.—MER

SurfWatch 3.0 for Windows 98

Though one of the most expensive packages in this roundup, SurfWatch 3.0 for Windows 98 was also the most effective during our testing. It does not offer as many features or customization options as Net Nanny, but it is more intuitive and reliable out of the box.

SurfWatch checks for objectionable material in five general categories: sexually explicit, drugs and alcohol, gambling, violence, and hate speech. Sites that contain enough words or phrases matching SurfWatch's filters for each category are automatically blocked, eliciting a "Blocked by SurfWatch" dialog box. You can update the filters easily through the program's minimal interface, and you can add custom filters to the mix.

Though far from foolproof, SurfWatch's filtering capabilities nonetheless impressed us. It



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AFTER HOURS



blocked all of our test sites and the majority of our searches on Yahoo! and HotBot. In some cases, the program blocked the search results themselves. In others, the searches worked but we could not access any of the obviously X-rated, drug-related, or racist links. Again, Excite searches allowed more access; the search results always came through, and many of the links worked just fine.

Newsgroup filtering was iffy, however. We were able to access some sexually explicit groups without interference from SurfWatch, while other groups elicited an error message from Microsoft Outlook Express.

SurfWatch is certainly not perfect, but it offers a good combination of reliability, ease of use, and customizability.—MER

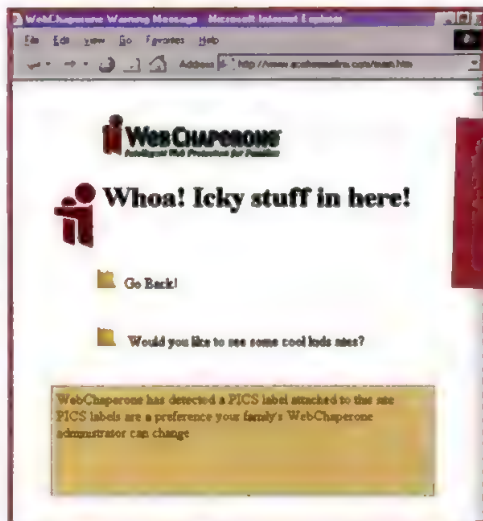
WebChaperone

Hampered by a few baffling design elements and iffy filtering capabilities, RuleSpace's WebChaperone may still be the product to watch in this category.

Using on-the-fly content scanning, WebChaperone is a

fairly reliable Web filtering utility. WebChaperone is designed to block sexually explicit material only, so it is not quite as flexible as Net Nanny or SurfWatch. Still, the tool blocked most of our test sites on initial loads. For those sites that got through the first pass, WebChaperone blocked all subsequent links.

Our Web searches yielded mixed results,



with WebChaperone blocking about half of our efforts on Yahoo! Excite and HotBot searches were much more tightly filtered, however. Unfortunately, the

program offers no newsgroup filtering.

We did like the humorous error messages generated by WebChaperone, which appear as HTML pages with phrases like "Whoa! Icky stuff in here!" The program was also the easiest to install and set up for multiple family members. We found it odd that the product registration page pops up the first time a user attempts to access a blocked site. When this happens, chances are that the user will be a child, who really shouldn't be filling out the product registration form. Including this during setup would make a lot more sense.

WebChaperone gave us the sense that it was the product with the most potential in this group. If subsequent versions can enhance the program's filtering reliability—for Web sites and newsgroups—this could easily become the best of the bunch.—MER

COMBAT SIMULATION

All-in-One Combat Sim

Known primarily for comprehensive simulations, such as EF2000 and Total Air War, Digital Image Design now brings us Wargasm, an impressive action/strategy combat game (distributed by Infogrames Entertainment) that lets players engage in heated battles as foot soldiers, tank drivers, and chopper pilots. The game has a few minor problems (such as the name), but it is fun and addictive, and it serves up some rather spectacular visual effects.

Imagine that 25 years in the future, all of the nations of the world agree to disarm and settle their grievances in cyberspace. They create the World Wide War Web, or WWW, an electronic battlefield designed specifically for this purpose. Your goal is to gain control of the entire

view, issuing orders to the group or to the individual units as necessary. You can also control them directly from a first-person perspective.

The first-person action is where Wargasm shines brightest. The game's stunning 3-D graphics make for convincing virtual combat. Astounding weather

are truly spectacular. The sound track, which features a mix of dramatic selections from Beethoven and Wagner, is equally spectacular.

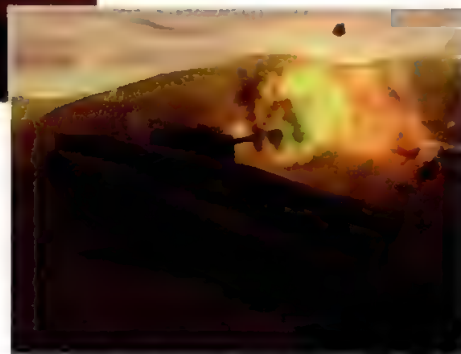
The game controls, on the other hand, are not so impressive. Though a recently released patch lets you customize the controls, they still require a great deal of practice to master. The worst part is a clumsy throttle system for moving individual foot soldiers. Also, the game can sometimes be extremely difficult to learn and control, and there is no adjustable difficulty setting.

Despite these relatively minor flaws, Wargasm is a slick game. The fast-paced battle-field action, a light touch of strategy, and the incredible 3-D engine should appeal to fans of action games and fans of simulations alike.—MER



WWW map in Risk-like fashion, moving your troops through each of the seven regions of the map.

Before each battle, you must choose your forces from among a finite supply of infantry, armor, and airborne units. You then place these units as a group on one of several predetermined starting locations and begin. You guide the units to their objectives by using an overhead map



and lighting effects enhance the rolling, believable terrain in each region. It is fair to say that no game does explosions quite as well as Wargasm does; they

ABOVE ALL, ELSA.

Be honest, you ever see what 16 megs of frame buffer and a 32-bit color Twin-Tee pipeline does to 3D? Check out the new ELSA **ERAZOR III** graphics accelerator with the  processor. It runs 3D at an unheard of 2048 x 1536 resolution and 2D that makes all the other stuff a dream. Is it fast?...heh...heh...heh.



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Mind Goo

Like most games found in the puzzle/strategy niche—such as *WarGames* and *KKND: Krush Kill 'N Destroy Xtreme*—*Gruntz* requires you to navigate your characters cooperatively and strategically through puzzle-ridden levels. The difference here is that these characters are cute, squishy-looking guys instead of scary monsters.

The game features 36 single-player levels in which you must help the wisecracking, goo-like Gruntz obtain pieces of a magical Warp Stone. They need this rock in order to get back to their home world, where their evil counterparts, the Disgruntled, have taken over.

With an excellent tutorial and a learn-as-you-go approach in the first four levels, *Gruntz*

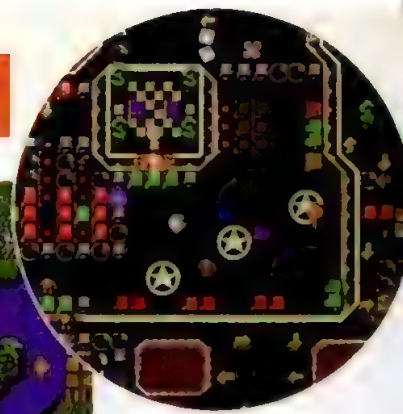
has a basic premise and controls that are easy to master. The increasingly difficult puzzles take place in a variety of wacky landscapes, ranging from a forest environment to a gambling casino. Puzzle solving never hits the frustration nerve, as there are more than 60 different tools, toys, power-ups, and spells that can be used to advance you through the levels and to help you defeat your enemies.

In addition to the single-player mode, there's an excellent multiplayer option. Four people can play up to eight multiplayer levels in a variant of the main game via LAN, serial connection, or the Internet. The multiplayer game is reminiscent of *Forts* and *Capture the Flag*—with you attempting to breach your



opponent's base before your opponent does it to you. The *Gruntz* home page (www.gruntz.com) does a great job of matching you up with other *Gruntz* enthusiasts for gaming.

Graphically, the game has simple but effective cartoonlike renderings that create an attractive and friendly atmosphere. In visual terms, it takes a 2-D from-above viewpoint, which is stan-



dard in the puzzle/strategy genre. This allows proper viewing of the playing area so you can see what you need to do in order to plan strategy accordingly.

An engaging game, *Gruntz* features many brain-straining puzzles and a lively, good-hearted feel that should keep players engrossed for hours. Replay value is high because of the multiplayer function, and an abundance of secrets hidden in each level make this one game that should not be overlooked.

—Roderick A. Beltran **PC**

Coming Up

What's in the Next Issue of *PC Magazine*

Office 2000

Microsoft's new suite is here, and *PC Magazine Labs* will take an in-depth look to help you decide whether it's worth upgrading and whether Microsoft has succeeded in making Office easier to use. We'll also check out the new Web publishing and collaboration features, what's involved in deploying and managing Office 2000, and what compatibility problems, if any, you can expect.

Network Printers in Living Color

Networked color printers are getting affordable, thanks to ink jet models that rival lasers in output. We'll test the quality, performance, and manageability of over two dozen such printers and tell you how they fare.

Job Hunting and Hiring on the Web

Whether you're looking for a job or trying to staff up, you can do it on the Web. We will test the leading job sites, examining the search process from both points of view—that of the recruiter and the job seeker. Recruiters will learn, for instance, the pros and cons of each site and whether it's worth the investment. Job seekers will find out which sites offer the best career advice and the most opportunities.



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PC Magazine, ISSN 0888-8507, is published twice a month except in July and August at \$48.97 for one year. Ziff Davis Inc., 28 E. 28th St., New York, NY 10016-7930. Periodicals postage paid at New York, NY 10016-7930 and at additional mailing offices. POSTMASTER: Address changes to *PC Magazine*, P.O. Box 54093, Boulder, CO 80328-4093. The Canadian GST registration number is 14049 6720 RT. Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 266477. Printed in the U.S.A.

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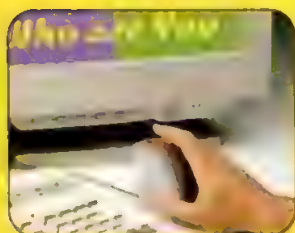
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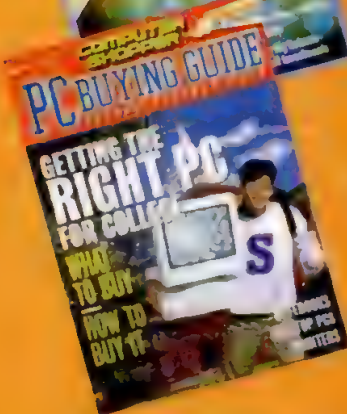
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AMD K6-3	400MHz	64MB	6.4GB	15"	\$1099.99	(CTPTM40)
AMD K6-2	400MHz	128MB	10.2GB	17"	\$1099.99	(CTPTM37)
Intel Pentium II	400MHz	96MB	10.2GB	17"	\$1249.99	(CTPTM12)
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Tiger 573 Form Factor: AT • CPU: Socket 7 • Bus Speed: Up to 75MHz • On Board Video: No • On Board Audio: YES • PCI Slots: 4 • ISA Slots: 2 • Memory: 2DIMM/4SIMM • Max Memory: 128/256 MB

Tiger 571 Form Factor: AT • CPU: Socket 7 • Bus Speed: Up to 83 MHz • On Board Video: PCI 4MB • On Board Audio: YES • PCI Slots: 4 • ISA Slots: 3 • Memory: 2DIMM/4SIMM • Max Memory: 128/256 MB

Tiger 598 Form Factor: AT • CPU: Super Socket 7 • Bus Speed: Up to 100MHz • On Board Video: AGP 8MB • On Board Audio: YES • PCI Slots: 3 • ISA Slots: 2 • Memory: 3DIMM • Max Memory: 768 MB

Tiger 6KE LX, 6BE+ BX Slot 1 With AGP

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Tiger SS7 Motherboard Features At-A-Glance
Form Factor: ATX • CPU: Socket 7 • Bus Speed: Up to 100 MHz • AGP Slots: 1 • PCI Slots: 5 • ISA Slots: 2 • Memory: 3DIMM Sockets • Max Memory: 768MB

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Tiger 767 Form Factor: AT • CPU: Slot 1 • Bus Speed: Up to 100 MHz • On Board Video: 8MB AGP • On Board Audio: YES • PCI Slots: 4 • ISA Slots: 1 • Memory: DIMM • Max Memory: 768 MB

Tiger 760 Form Factor: Micro ATX • CPU: Slot 1 • Bus Speed: Up to 100MHz • On Board Video: 8MB AGP • On Board Audio: YES • PCI Slots: 3 • ISA Slots: 1 • Memory: DIMM • Max Memory: 768 MB

MOTHERBOARD SPECIFICATIONS

Motherboard Design	Processors Supported	Item No.	1-2 units	3+ units	Item No.	1-2 units	3+ units	Item No.	1-2 units	3+ units
Tiger 571 AT including Wave Table sound and PCI video	AMD Up to K6-300 & K62-266 Intel Pentium up to 233 MMX IBM/Cyrix Up to PR300	MB1-C-1B	\$75.99	\$68.99	BB1-C-1B	\$124.99	\$114.99	KT1-C-1B	\$214.99	\$197.99
					Mid-tower AT case with 200-Watt power supply			See what's included above.		
Tiger 573 AT including Wave Table sound	AMD Up to K6-300 IBM/Cyrix Up to PR300; Intel Pentium up to 233 MMX	MB1-E-8A	\$39.99	\$37.99	BB1-E-8A	\$99.99	\$85.99	KT1-E-8A	\$169.99	\$159.99
					Mid-tower AT case with 200-Watt power supply			See what's included above.		
Tiger 598 AT including 1MB Cache, Wave Table sound and PCI video	AMD Up to K6-3/400 Intel Pentium up to 233 MMX IBM/Cyrix Up to PR350	MB1-E-11A	\$79.99	\$75.99	BB1-E-11A	\$139.99	\$132.99	KT1-E-11A	\$224.99	\$216.99
					Mid-tower AT case with 200-Watt power supply			See what's included above.		
Tiger SS7 Super Socket 7 1MB Cache	All AMD Up to K62-400; Intel Pentium up to 233 MMX IBM/Cyrix up to MII 350	MB1-T-7B	\$89.99	\$64.99	BB1-C-2D	\$129.99	\$119.99	KT1-E-2C	\$259.99	\$249.99
					Unassembled—ATX case with 235-Watt power supply & Free Floppy Drive			See what's included above.		
Tiger 767 AT Slot 1 with Sound & AGP video	Celeron up to 433MHz Intel Pentium II up to 500MHz	MB1-E-5A	\$93.99	\$83.99	BB1-E-5A	\$149.99	\$137.99	KT1-E-5B	\$249.99	\$229.99
					AT Case 200 W Power Supply			See what's included above.		
Tiger 760 Micro-ATX Slot 1 w/Sound & AGP video	Celeron up to 433MHz Intel Pentium II up to 500MHz	MB1-E-6A	\$93.99	\$83.99	BB1-E-6A	\$139.99	\$128.99	KT1-E-6A	\$224.99	\$209.99
					Micro ATX Case 140W Supply			See what's included above.		
Tiger 6KE LX ATX Slot 1	Celeron up to 433MHz Intel Pentium II up to 333MHz	MB1-T-10A	\$45.99	\$35.99	BB1-T-10A	\$114.99	\$99.99			Not Available
					Unassembled—ATX case with 235-Watt power supply & Free Floppy Drive					
Tiger 6BE+ BX ATX Slot 1	Celeron up to 433MHz Intel Pentium II up to 500MHz	MB1-T-9A	\$84.99	\$77.99	BB1-T-9A	\$149.99	\$139.99			Not Available
					Unassembled—ATX case with 235-Watt power supply & Free Floppy Drive					

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this stuff? Try to match the weird
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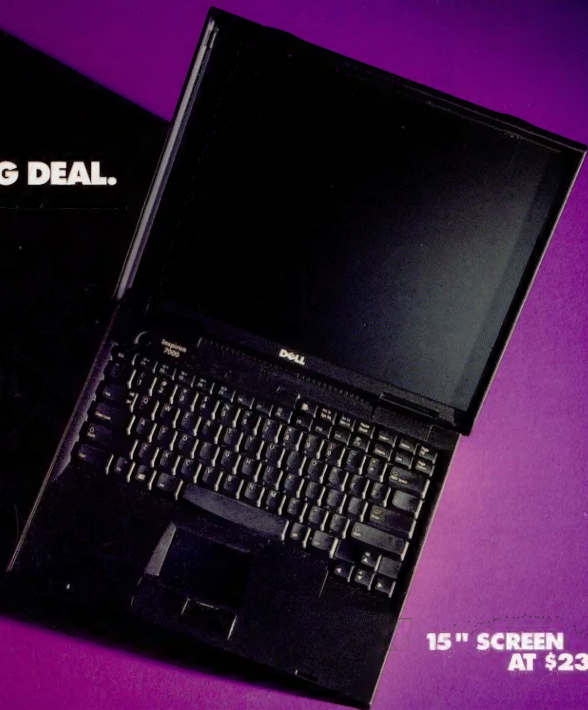
1. Looks like somebody woke up on the wrong side of the coffin.
2. Praise the Lord and pass the ammunition.
3. The vacation they'd kill for is the vacation you'll die for.
4. To hell with the fittest. Surviving with your organs intact is victory enough.
5. Come on in, stay awhile—Mind if I cut your head off?
6. Cut your umbilical cord to Mother Earth.
7. Live fast, die wet.
8. Dark dreams of blood and fire, of drums pounding rhythm—here lies the amber cinder of your voodoo.
9. Let them eat lead.
10. Who you callin' a pussy?

- A. Rogue Trip
- B. Streak Hoverboard Racing
- C. Duke Nukem: Time To Kill
- D. Medieval
- E. Akuji the Heartless
- F. Dead in the Water
- G. Apocalypse
- H. Minta: Shadow of Darkness
- I. Tai Fu: Wrath of the Tiger
- J. Kagero: Deception II

Answers: 1-D; 2-G; 3-A; 4-H; 5-J; 6-B; 7-F; 8-E; 9-C; 10-I.

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